Charles University in Prague

Faculty of Social Sciences
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Foreign Direct Investment in Emerging Markets: The Case of Turkey

MASTER THESIS

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Academic Year: **2013/2014**

Declaration of Authorship

The author hereby declares that he compiled this thesis independently, using only the listed resources and literature, and the thesis has not been used to obtain a different or the same degree.

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Prague, May 14, 2014

Signature

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I am grateful to doc. PhDr. Adam Geršl Ph.D. and my friends for their comments and support during my research.

Abstract

This paper studies determinants of FDI in Turkey using panel data analyses. The results of the study show that political stability, education level, rule of law, and trade cost have significant impact on FDI inflow in Turkey while similarity in economy size of home and host country (Turkey) has not. The effect of the trade cost and rule of law was surprising but it gave a clue to new research area. It was concluded that next studies of FDI determinants in Turkey must be conducted at firms' level to better understand the behaviour of foreign direct investments in the country.

JEL Classification F21
Keywords FDI, Turkey, Rule of Law, Trade cost

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Master Thesis Proposal

Author:	Bc. Orkhan Huseynli
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Defense Planned:	June 2014

Proposed Topic:

Foreign Direct Investment in Emerging Markets: The Case of Turkey

Topic Characteristics:

My thesis will focus on determinants of inward FDI in Turkey. Turkey's rapidly growing economy attracts investors and it is thus relevant to analyse the determinants of inward FDI. For my research, I will use official data (mostly reports) from official websites of Turkey and international organizations (like Ministry of Economy, Invest in Turkey, OECD, UNISTAT and others). The methodology of my research will follow existing literature.

There is some literature on FDI in Turkey, such as Kayam (2009) or Central Bank of Turkey (2013). In my research, I will follow Esiyok (2010) who covers the main determinants of FDI inflows in Turkey that were not covered by previous authors. However, my research will provide additional value added to Esiyok (2010), namely: (i) I used the data between 2001 untill 2012 for the research as opposed to Esiyok (who used data since 1982 to 2007) because most of FDI inflows into Turkey are concentrated between 2000-2011 time period. In addition, this is the period when political stability was established in Turkey and the new government started many projects to improve Turkey's economic and institutional structure; (ii) my observations cover top 25 countries that have directly invested in Turkey during selected time period. It includes not only OECD countries but also non OECD countries that were not covered by previous studies including Esiyok's; (iii) I used variables different from what Esiyok had used for defining FDI in Turkey. First of all, I include EDUC variable which is going to capture education level in Turkey. I also include political stability and rule of law variables while Esiyok just use one variable that captured both of these variables.

Hypotheses:

1. Hypothesis #1:
   Political stability in the country attracts higher volume of FDI.
2. Hypothesis #2:
   Higher level of education attracts FDI into the country
3. Hypothesis #3:
   Better institutional framework of a country would increase its inward FDI
4. Hypothesis #4:
   Similarity between countries sizes increases FDI between them
5. Hypothesis #5:
   Higher trade costs of firms motivate them to switch to FDI.

Methodology:

I am going to specify a panel model with cross section dimensions (home countries "i",i=N number of countries, and the host country Turkey "h" and time dimension "t", K years, to test the above mentioned hypotheses.

The model will be specified as a gravity model as it contains variables such as trade cost between two countries and market size of two countries

$lnFDI_{hit} = \beta_1 PSTAB_{ht} + \beta_2 lnSim_{iht} + \beta_3 TC_i + \beta_4 EDU_{ht} + \beta_5 LAW_{ht} + \varepsilon_i$, where

lnFDI – log of inward FDI data to Turkey
PSTAB - political stability of a host country at time "t"
LnSimIndex – log of similarity index of GDPs of a country (i) and the host country
TC - trade costs of exports from country (i) to the host country (Turkey).
EDU – education level of host country at time "t"
LAW - rule of law in the host country (Turkey)

The methodology should correspond to the hypotheses and the available material specified.

Outline:

1. Introduction
2. FDI in Turkey and Turkish Economy
3. Literature Review
4. Conceptual framework and Methodology
5. Data description
6. Empirical Results
7. Conclusion

Core Bibliography:

Brooks, C. (2008). *Introductory Econometrics for Finance.* New York: Cambridge University Press.

Bahmaid , S. (2013). "Study on Foreign Direct Investment in Education" International Journal of Advanced Trends in Computer Science and Engineering, 2 (1), 519 – 531

Carr, D. L., Markusen, J. R., & Mask, K. E. (2001). Estimating the Knowledge-Capital Model of the Multinational Enterprise. The American Economic Review , 91 (3), 693-708. Retrieved from: http://ces.univ-paris1.fr/membre/toubal/M1/CI/10_CMM.pdf

Esiyok, B. (2010, June). *Determinants of foreign direct investment in Turkey: a panel study approach.* Retrieved June 2013, from EconPapers: http://econpapers.repec.org/paper/pramprapa/36568.htm

Markusen,J., Venables, A. (1997). "Multinational firms and the new trade theory" Journal of International Economics, 46 (1998), 183–203. Retrieved from: http://www.princeton.edu/~erossi/courses_files/Markusen.pdf

Neumayer, E. a. (2005). *Do bilateral investment treaties increase foreign direct investment to developing countries?* Retrieved June 2013, from The London school of Economics and Political Science: http://eprints.lse.ac.uk/627/

Saime S. Kayam, M. H. (2009, March). *Determinants of Turkish FDI Abroad.* Retrieved June 2013, from Loyola University Chicago: http://www.luc.edu/orgs/meea/volume11/PDFS/Paper-by-

Kayam&Hisarciklilar.pdf

Author **Supervisor**

1. Introduction

Turkey has always been very interesting to investors for its large domestic market, skillful labor force and geographical location. Its rapidly growing economy attracts investors from all over the wold. Only for the last five years there had been registered 395 investment projects with total value of USD 87.1billion. It is the result of Turkish Government's successful economic program after the 2001 banking sector crisis. A stable macroeconomic and institutional framework has brought the country to the prosperity and rapid growth. Therefore for the last 10 years, Turkey had been competitive over other growing economies because of its strong economy, political stability, future growth potential, solid banking sector and institutional framework. It was interesting to know which of these factors had really been determinants of FDI in Turkey and the extent of their effect on FDI inflow.

After reviewing relevant literature, I decided to employ a knowledge-capital framework (Markusen et al., 1996) to estimate FDI determinants in Turkey. I followed Esiyok (2010) who covered the main determinants of FDI inflows in Turkey that were not covered by previous authors like Kayam (2009) or Central Bank of Turkey (2013). However, my research provides additional value added to Esiyok (2010), namely: (i) I used the data between 2001 untill 2012 for the research as opposed to Esiyok (who used data since 1982 to 2007) because most of FDI inflows into Turkey are concentrated between 2000-2011 time period. In addition, this is the period when political stability was established in Turkey and the new government started many projects to improve Turkey's economic and institutional structure; (ii) my observations cover top 25 countries that have directly invested in Turkey during selected time period. It includes not only OECD countries but also non OECD countries that were not covered by previous studies including Esiyok's;

(iii) I used variables different from what Esiyok had used for defining FDI in Turkey. First of all, I include EDUC variable which is going to capture education level in Turkey. There is empirical evidence that higher level of education attracts more FDI inflow to the host country. It totally coincides with the fact that Republic of Turkey had been conducting huge investments in education since 2001-2002 and exactly since that time the level of FDI inflow had been increasing in Turkey.

To capture the level of institutional framework in Turkey, I used World Bank's rule of law index instead of bilateral treaties as a binary variable used by Esiyok. Namely, this index reflects the quality of how contract terms and property rights are respected in the country. Also I include one more variable to the model – political stability. Number of empirical works like Buthe, T. & Milner, H. (2008), Bissoon, O. (2011) and Haksoon, K. (2010) show strong relationship between political stability and FDI inflow. It is important to note that Esiyok (2010) took political stability and institutional framework as one variable contrary to what I did. I have two different indices because in my paper institutional framework is more about law enforcement, property rights, copyrights and business code while political stability is about probability of the government destabilization that may happen as a result of unconstitutional or violent actions.

The thesis is structured as follows: first, I introduce basic and relevant information about foreign direct investment in Turkey and Turkish economy in chapter 2. In chapter 3, I provide brief information on the main theories and literature relevant to my research. Chapter 4 covers the conceptual framework and methodology employed in this paper. Chapter 5 is dedicated to the data used during empirical estimations. Finally, chapter 6 covers empirical estimations and then, in chapter 7, I provide concluding remarks of the paper and give some comments regarding conducted work.

The contribution of this study to the existing literature could be summarised as follows. First this study partially confirms the previous studies on foreign direct investment determinants in Turkey. Even using different time period and larger sample of countries, similarity index is found insignificant, while trade cost – significant. Esiyok (2010) had same findings regarding these variables.

Second, some of variables used by Esiyok were extended to get more precise estimations. For example, Esiyok used political stability and institutional framework as one variable, while I had them as separate variables. This split was made taking into consideration other empirical papers. These two variables account for different factors and they should not be taken as one variable. As a result, each of these variables was found significant.

Third, it was found out that trade cost has negative effect on foreign direct inflow contrary to Esiyok's finding. It was inferred that this finding didn't contradict Esiyok's result but just was a matter of different study. Namely, it was found out that whether the trade cost has positive or negative effect on foreign direct investment depends on nature and characteristics of an investing firm. Therefore, it was concluded that next empirical work covering foreign direct investment inflow must be done on firms' level.

2. FDI in Turkey and Turkish Economy

2.1 Transition period between 2001 and 2007

In this paper, I will be concentrated more on economic trends of Turkey since 2001. However, it is important to mention that Turkey had been struggling to improve its economic indicators almost for a century since the establishment of Republic of Turkey.

By 1999, Turkey had high budget deficit and high inflation. Turkey entered into the IMF stand-by arrangement (SBA) in December 1999 in hope to fix its economic issues. Although, initially, the programme was successful, it could not help to decrease the inflation rate for the expected time period.

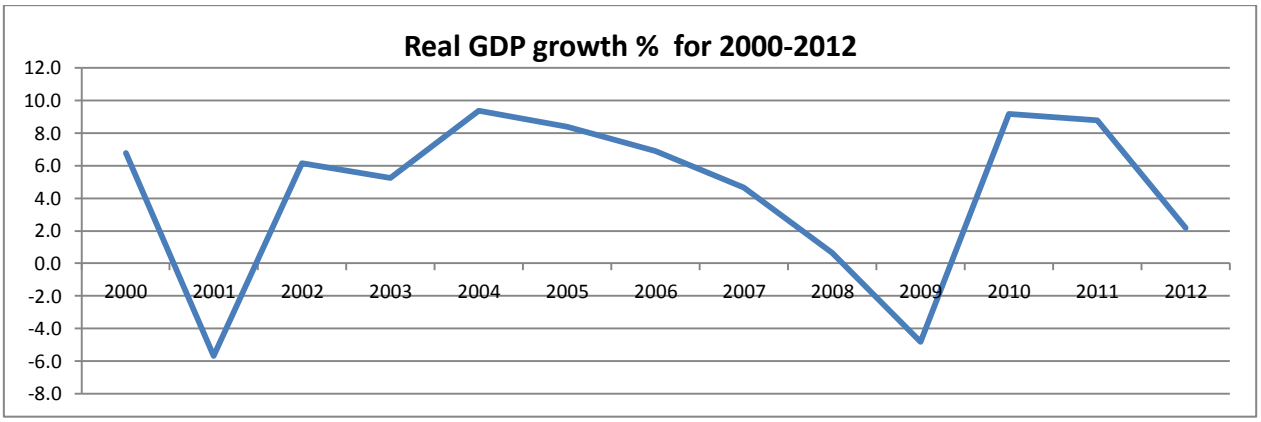
Although inflation started to fall, the process was slower than anticipated. At the same time, interest rates also fell down much later than expected. Meanwhile, these factors along with steady real exchange rate appreciation increased domestic demand and current account deficit. Moreover, Turkey could not get expected results from its fiscal and structural reforms which became an impediment for diligent implementation of adopted SBA programme. In 2000, faced with increased interest rates and the treasury's borrowing capacity, Central Bank of Turkey injected liquidity in the system which kept interest rates from rapid growing. Nevertheless, in the beginning of 2001, the Treasury again faced high interest rates on the market which led to new measures on monetary policies of the country. By the end of 2001, the real GDP had declined by 5.7%, investments collapsed by 30% and industrial output dropped by 8.7% as a result of unsustainable economic situation in the country. Unemployment rate continued to grow reaching 10.4 % in 2002. Public debt had increased from 38.2 % of GDP in 2000 to 74.1% of GDP by 2001. (Macovei, 2009). Ozatay and Sak (2002) found out that the root cause of the emerging financial crisis was combined effects of weak banking sector and high public sector borrowing. Public sector borrowing requirements were quite large comprising 10% of GDP during 1999-2002. During the same period, several banks were caught on fraud and taken by authorities. Eventually, banking sector had deteriorated to the point where it could not provide stable financing of the public debt. This was a signal of growing unsustainability in the banking sector leading Turkey to the banking crisis.

But Turkey's 2000–01 banking crisis was a very important point in the country's growth story. To prevent the country from repeated inadequate macroeconomic policies and save it from a weak regulatory environment, the government undertook sound structural reforms with very diligent control of running processes. The undertaken economic programs were focused on strong macroeconomic and structural reforms. The main goal of undertaken policies was to improve banking system creating better investment climate, liberal foreign investment and privatization environment.

Thus, during 2001 and 2002, Turkey has improved its macroeconomic stability conducting sound fiscal and monetary policies. A set of structural reforms were undertaken in the banking sector that positively affected the stock of contingent liabilities. In addition, a lot of important reforms were also conducted in the area of enterprise restructuring and privatization, trade liberalization, labor market and business environment. These measures helped the country to boost its foreign and domestic investments, increase labor productivity and thus inducing economic growth.

Since 2002, Turkish Economy had started recovering from 2000/2001 crises through these economic and regulatory reforms that improved Turkish economy's resilience to shock.

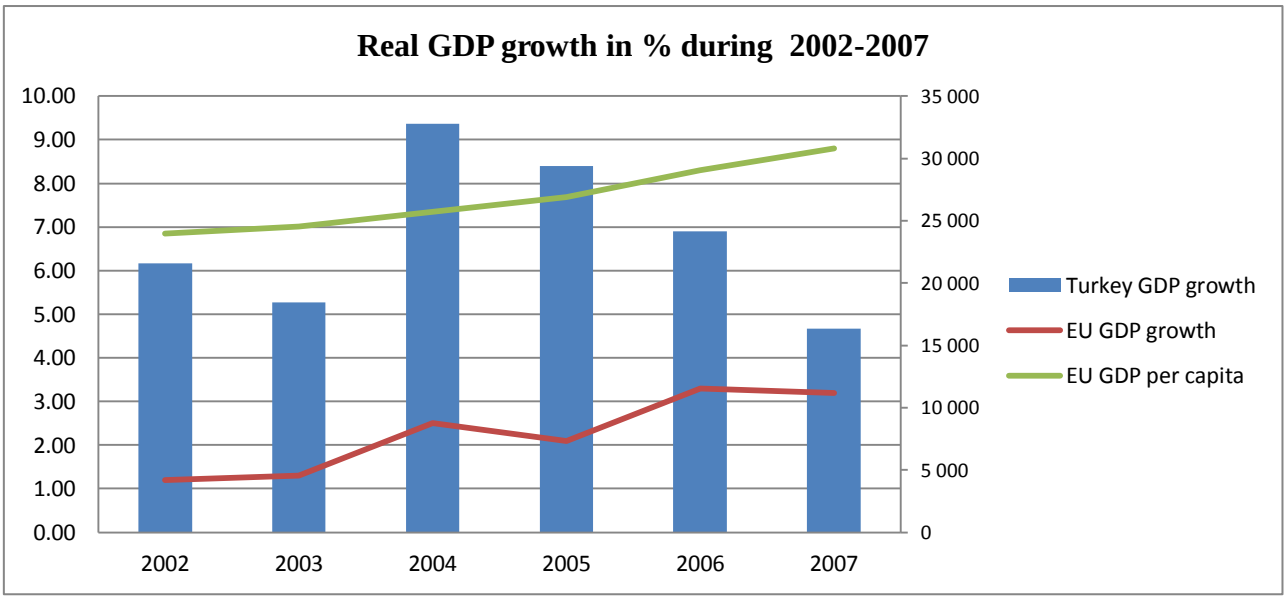
Figure 1. Economic growth of Turkey during 2000-2012



Source: based on data compiled from OECD stat

In addition, decreasing political uncertainty was important factor in economic recovery of Turkey between 2000 and 2012. This happened thanks to single-party majority government which won elections in 2002 and played significant role in implementation of IMF stand-by arrangement and other reforms.

Figure 2. Convergence with EU



Source: based on data compiled from OECD stat

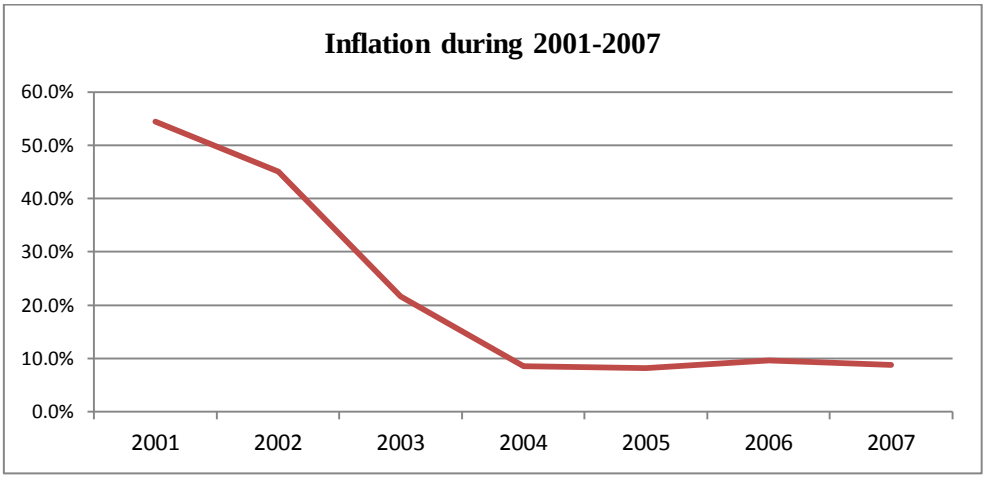
The peak of economic recovery lies in period between 2002 and 2007 when the real GDP grew on average by 6.8% annually. Growth can be explained by increasing private consumption and investment boom growing on average by 15%. Government had been putting a lot of effort in improving the business environment and attracting FDI to the country. The result of these efforts can be observed from increasing investment ration that climbed from 22% in 2002 to 29% in 2007. Significant growth was recorded in machinery, motor vehicles and metals. This was a progress for Turkish economy as before it had been known only for its traditional low value-added sectors like textiles, leather products, and wearing apparel. Thus, Turkey started quickly catching up the rest of

Europe in economic growth as demonstrated in figure 2. GDP per capita grew from around 8 200 USD in 2002 to around 13 900 USD in 2007 and unemployment rate fell from 10.3 in 2002 to 8.8 in 2007.

Macroeconomic stabilization program implemented during 2002-2007 was very successful and played a significant role in inducing growth during this period. Turkey's adopted fiscal consolidation program helped to decrease the public debt burden to low levels and increase investor confidence and inflationary expectations. The public sector borrowing requirement was reduced from around 12% of GDP in 2001 to almost 0 in 2007. Also, the debt-to-GDP ratio had been reduced because of the appreciation of the Turkish lira in real terms. External debt comprised only one third of the 2001 value by the end of 2007.

Monetary policies were designed to support macroeconomic stabilization. First of all, the newly independent central bank adopted strict fiscal policy to pursue price stability objective. It managed to stabilize inflation expectations which caused the decline of annual inflation rate from 54,4% in 2001 to 8,8% in 2007 as depicted in Figure 3.

Figure 3. Inflation in Turkey during 2001-2007



Source: based on data compiled from OECD stat

2.2 Economic Growth by 2011-2012

After a rapid economic transformation between 2001-2007, Turkey has had fascinating economic growth by 2012 with GDP growth rate of nearly 6 % in average and per capita income of almost 11 000 USD in 2012 compared to very small number of 3 000 USD recorded in 2001. It is important to note that Turkey as well as the rest of emerging markets had been affected by the global crisis of 2007-2008. It had experienced economic slowdown because its economy was linked with the global economic and financial system as any other free-market economy. As a result, demand on Turkish export had declined and there was significant slowdown in capital flows from abroad. This was immediately followed by net capital outflows, currency depreciation and a fall in stock prices. In addition rising risk premium and decreasing liquidity in the banking sector worsened the investor environment and economic situation. Such situation had lead Turkey to the point where uncertainty over Turkish economy were rising followed by loss of business and consumer confidence in the market. Therefore, there was significant decrease in investments and households' consumption in the country.

But its strong fiscal discipline saved Turkey from the burden of crisis. Turkey had been very careful in its budget management: it had decreased its general government budget deficit/GDP ratio to 2.6% in 2011 from 17% that was recorded in 2001. In addition, Turkey had also decreased its net public debt to GDP ratio from 91% (in 2001) to 39 % (in 2011) and had improved its debt stock by making it more resilient to fluctuations. These results were the outcome of diligent fiscal policy over the last decade and thus Turkey outperformed most of EU countries in 2011.

Meanwhile the Central Bank of the Republic of Turkey (CBRT) cut the main policy interest rate and targeted interest rate of 6.5 % by November 2009. As a result nominal interest rates reached the lowest level and real interest rates approached almost zero. That was first time when the real interest rate approached such level since the beginning of 2002. In addition, required reserve ratio of the Turkish lira was reduced from 6% to 5% in October 2009 to support liquidity and lending environment. Despite lots of effort to keep inflation rate at 6 %, the inflation rate had reached 8.9 % in 2012. By that time, the domestic demand had been growing slowly but exports were increasing although it had not been expected.

The overall growth rate between 2008 and 2009 became less than the growth rate in the period of 2002 and 2007. Despite the economic slowdown during the global crisis, Turkey had managed to overcome the consequences of the downfall and achieved a growth rate of about % 9 in the next year and %8.8 in 2011.

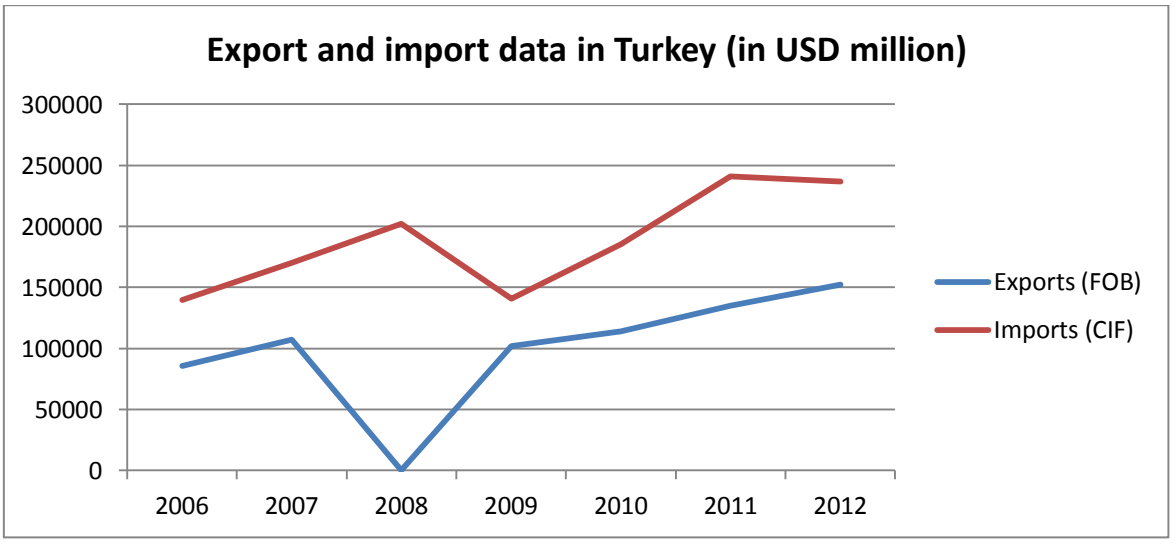
In 2012 the Turkish economy grew only by % 2.2 (below the expected %2.6) because its exports didn't cover declining domestic demand. Specifically, it is the joint effect of two factors: low domestic consumption and increase in state consumption and investment expenditures. Still even this small growth was accompanied by a gross domestic product of almost USD 65 billion making Turkey the 17th largest economy in the world with a GDP of about USD 800 billion in the same year.

2.3 Foreign Trade and FDI in Turkey

Foreign Trade

Turkey plays an important role in international trade and global economy as a rapidly growing emerging market. The volume of its total exports had reached the level of almost USD 153 billion in 2012 supplying more than 200 countries with various services and goods. The annual average growth of Turkish exports was 11% between 2000 and 2010, which is higher than both the world's average growth rate - 6% and emerging market's average growth rate - 8%.

Figure 4. Export and import data in Turkey between 2006 and 2012



Source: based on data compiled from TurkStat

Also in the last decade, Turkey finally made significant changes in the commodity composition and structure of its exports. Its share of motor vehicles, machinery and equipment become higher than the share of traditional exports, such as textiles and garments. Meanwhile, the export market has also been diversified: exports have been

increased to Central Asia, Middle East and North Africa over the last 10 years making the Turkish export less dependent on demand in Europe. Also, there was diversification in the sourcing of exports within the country. Earlier exports were concentrated in major cities like Istanbul, Izmir, Bursa and Antalya. However for the last decade, a lot of medium sized producers have been established in other parts of Turkey that mainly export their goods to neighboring countries.

FDI in Turkey

Turkey had positioned itself as one of the most attractive investment destinations for foreign investors. The country is very attractive for its successful economic performance in recent years, its strategic location, skilled labor force, large domestic market, low tax rates, various incentives, customs union with EU, and, at last, stable political and economic environment that was established recently.

Having investments in Turkey, international companies open the gates to three regions: Middle East, Europe and Africa. This is one of the reasons why one third of top 500 companies in Turkey are sponsored by foreign investors. Today, the cumulative value of foreign investments comprise almost USD140 billion. These investments are unusually either industrial or services projects. Although Turkey's skillful labor force is most suitable for manufacturing projects, most of investments account for services projects.

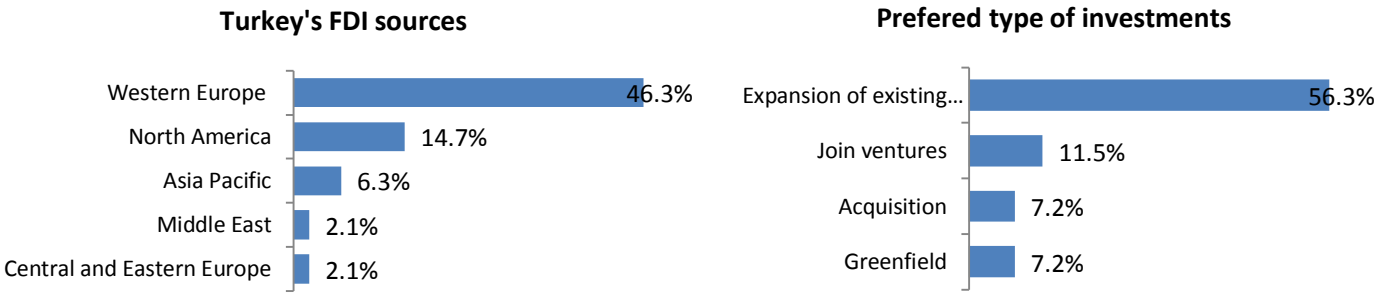
Most of foreign direct investment projects between 2007 and 2012 were located in Istanbul, Izmir, Ankara and Bursa. These are the most attractive cities in Turkey because of their perfect geographical location, developed transport and logistics systems, infrastructure and labor force. The implemented projects mostly covered knowledge-

driven sectors like financial services, communication technologies, and business services. But in earlier years, between 2000 and 2007, other sectors like real estate, construction, hospitality and energy were main focus of foreign investors in Turkey. Most of foreign direct investments in Turkey come from developed countries rather than from developing. Namely, the European Union is the main source of investment flowing to Turkey, where Germany and United Kingdom are the largest funders present in the country.

In recent years there was also significant increase in investments from developing countries to Turkey. For example, Azerbaijani oil companies started acquiring some of Turkey's existing businesses, building their own chain of petrol stations and business centers.

According to the report of Ernst & Young (2013), major part of investments will cover expansion of existing businesses in Turkey and join ventures. Less than half of foreign direct investments will cover Greenfield investments and acquisitions.

Figure 5. FDI in Turkey by sources and type of investments



Source: Ernst & Young's EIM, 2013

In near future, Turkey plans investment of USD 250 billion in energy and transportation sectors that are important for accelerating trade and investment environment in the country. This is an important part of plan to become one of the top 10 economies in the world by 2023.

FDI by sector

Investors show bigger interest in knowledge-intensive and heavy industry sectors. This interest is also supported by government which puts a lot of effort to improve the relevant investment climate. According to the country report from Ernst & Young (2013), the top sectors for foreign direct investment in Turkey are business services and financial services although the Turkish government puts more value on manufacturing and financial intermediation.

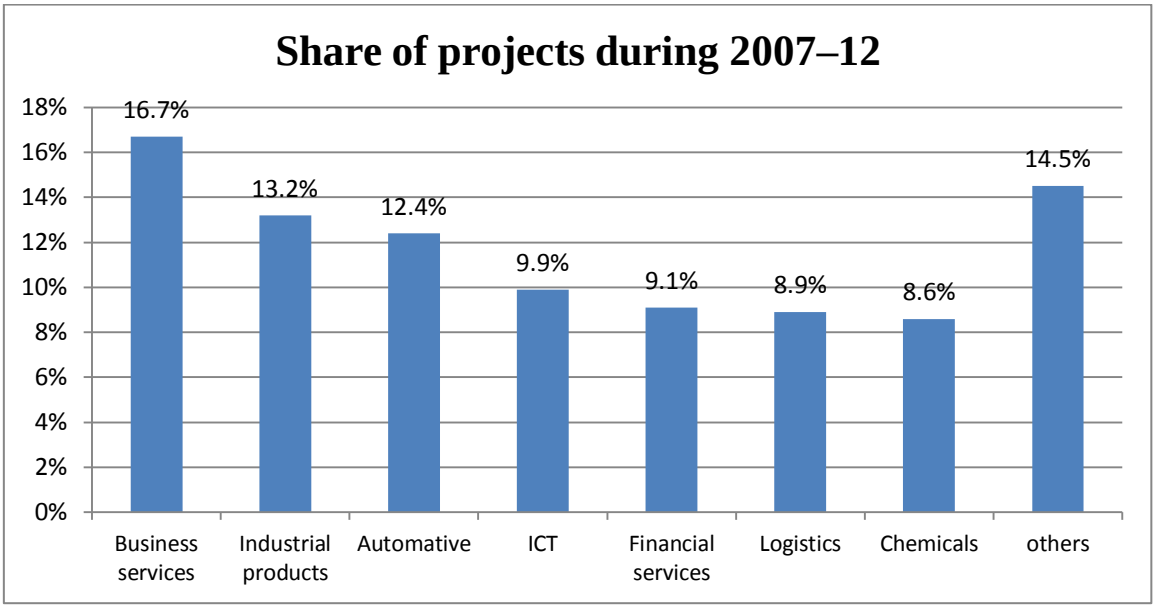
There are several reasons why business services had been the most preferred sector between 2007 and 2012. It was combination of two factors: 1) a lot of companies had established their sales and marketing offices in Turkey because of its strong growth potential and macroeconomic stability; 2) also a lot of companies from other sectors build up their presence in the country. These are two significant factors that created opportunities for services sector.

Manufacturing sector has accounted for 34.4 % of the total projects between 2007 and 2012. According to survey conducted by Ernst & Young (2013), 38.5 % of respondents plan to invest in manufacturing in Turkey. Labor force and cost competitiveness are main determinants of interest in this sector. Some of investors in manufacturing are focused on the production for the local Turkish market while others - for export. Most of these

manufacturing projects are initiated by investors from Western Europe. This is the part of their long term strategy whose goal is to relocate operations from their home countries to Central and Eastern Europe.

Right after manufacturing sector, the most desirable sector in Turkey for foreign investors is sales and marketing. Investors mainly from US, Germany and the UK have big appetite for this industry. The average growth rate of the sector between 2007 and 2012 was 53.8 %.

Figure 6. Share (in %) of projects by sectors during 2007-12



Source: Ernst & Young's EIM, 2013

Also in recent years, Information, communication and technology sector in Turkey has been gaining more and more interest of foreign investors. Currently, the ICT sector in Turkey represents a huge investment opportunity for domestic and foreign investors and has a lot of support from government through various incentives. Already, large

international companies like Huawei, Ericsson and the Vodafone Group, have established R&D centers in Turkey.

And at last, the financial services sector in Turkey has been also growing in recent years making it very interesting sector for foreign investors. The average growth rate of the sector between 2002 and 2012 was 10%. Sector's large investors are US and Western Europe.

3. Literature Review

3.1 Theoretical background: Electric paradigm

Dunning (2001 and 1993) developed the eclectic paradigm theory that explains why firms do businesses abroad via trade or foreign direct investment. According to Dunning, FDI flows are determined based on three types of advantages: Ownership, Location and Internalization. That is why his theory is named OLI paradigm. His study suggests that firm, first, looks for ownership advantages which refer to intangible assets that are exclusive possesses of the firm for period of time.

Second, it must be beneficial for the company to use owned assets rather than sell them or rent them abroad. This is location specific advantage. Third, the firm must benefit from the ownership and location advantages and internalize them (internalization advantages).

Further, Dunning (1993) identifies four types of FDI based on motive of investment: 1) market-seeking, 2) resource-seeking, 3) efficiency-seeking and 4) asset seeking.

Market-Seeking investment - investment is planned to serve local market where investment takes place. Firms having for market-seeking motive usually want to avoid restrictions imposed by the government in the home country like tariffs, and host country like import restrictions, import control and etc.

Natural Resource-Seeking Investment – Firms pursuing this motive want to decrease their costs and get efficient and stable supply resources.

Efficiency-Seeking Investment – sometimes, when MNEs are going large enough, they aim to increase their global competitiveness and overall efficiency.

Asset-Seeking Investment – after certain stage of development, some MNEs want to expand its global position pursuing long-term strategic objectives like acquisition of different firm's assets abroad (even its competitors').

The OLI framework gives basic idea about how and why firms become multinationals. Dunning's Eclectic Paradigm have been used in several empirical studies analyzing the determinants of FDI. For example, Carmen Stoiana and Fragkiskos Filippaios (2008) used OLI paradigm in their study which aim was to test the effect of ownership and location advantages in determining the internalization decisions by Greek investors. The analyzed the Greek economy during 1990s when the opening up of neighboring markets created an opportunity for the Greek firms to exploit their ownership advantages and expand abroad. Stoiana and Filippaios used Dunning's eclectic paradigm (OLI) as a valid context specific framework to analyze foreign direct investment (FDI) determinants.

3.2 New Trade Theory Approach

The New Trade Theory Approach was developed to compensate shortcomings of OLI framework. Specifically, it fails to explain the rise of FDI among rich industrial countries

at the time of falling trade barriers. Therefore sometimes it is called the industrial-organization approach to trade. It incorporates ownership, location and internalization advantages into general equilibrium models and predicts the pattern of trade. In this new framework, knowledge capital is the ownership advantage and its joint-input characteristic increases internalization advantages. As OLI framework, it also has location advantages which include trade costs, market size and differences in relative endowments of countries. The new theory explains the location decision of MNEs by competing hypothesis – the proximity-concentration and the factor proportion hypothesis. (Esiyok, 2010)

According to Proximity-Concentration Tradeoff hypothesis firms expand horizontally across borders to enter the targeted market at the expense of production scale economies (Carr, L., Markusen, R., & Mask, E., 2001). For example, consider two sector two country worlds with identical demand and constant elasticity of substitution σ among various goods. If a firm has to select one option from two - to export or cross border expansion/foreign direct investment, its decision whether to expand abroad via trade or via investment depends on a trade-off between scale advantages and proximity advantages from establishing production in one location. (Brainyard, L., 1993)

Factor Proportion Hypothesis is based on the theory of endowment comparative advantage, most specifically land, labor and capital. An example of the advantage gained by this model is if you were to take two countries, where first country (A) exports labor intensive goods (i.e. textiles) to the second country (B) who in turn trade capital intensive goods (Financial market). In this way wages paid to labor in the country (A) increases as returns to capital employed increase in the second country (B). (Clark, K., 2009)

3.3 Determinants of FDI in Turkey

There were conducted only a few empirical studies about FDI in Turkey. Recai Coskun (2001) analyses earlier surveys examining determinants of FDI in Turkey and finds out that major determinants of foreign direct investment in Turkey are factors such as ``the promising Turkish economy'' and ``growing local market'' rather than location-specific factors such as low cost labor, cheaper inputs and geographical location.

Demirhan, E. and Masca, M. (2008) examine the determinants of foreign direct investment inflows in developing countries over period of 2000-2004 by estimating cross-sectional econometric model. They found growth rate of per capita, telephone main lines, degree of openness, inflation rate and tax rate statistically significant. All variables had positive sign except inflation rate and tax rate. Labor cost and risk were found insignificant.

Empirical work specifically over Turkish FDI, was conducted by Kayam, S. and Hisarciklilar, M. (2009). They explore the determinants of Turkish outward FDI using a gravity model. In their model, they estimate not only the impact of traditional gravity variables but also openness, labor productivity, infrastructure, institutions and economic stability on FDI outflows from Turkey to 11 large importers of Turkish export over the period 1999-2005 years. They found out that home and host country incomes, distance/transport costs, market size, openness, corruption and Turkey's economic stability are the main determinants of Turkish FDI abroad.

The most recent empirical work examining determinants of FDI in Turkey was done by Esiyok, B. (2010). He employs a knowledge-capital model and finds that joint national incomes, per capita difference, investment liberalization and the cost of exporting to

Turkey have significant effects on FDI in Turkey. Furthermore, he finds other determinants of FDI in Turkey like the prospect of European Union membership, government stability, infrastructure, bilateral exchange rate, exchange rate volatility and openness to trade. Also, in the same paper, Esiyok finds positive correlation between exports and outward FDI stocks using the augmented gravity model.

3.4 Market size and GDP

Frequently, market size of the host country measured with GDP is considered to be one of important determinants of FDI inflows. The basic idea is that larger markets promise higher return to investment owing to more efficient utilization of resources and higher economies of scale. Hara, M. & Razafimahefa, I. (2003) found out that the size of the market is an important determinant of FDI in Japan.

Imad Moosa (2005) finds GDP growth rate as one of determinants of FDI. He conducts extreme bound analysis to a sample of 18 MENA countries. His main conclusion is that countries with growing economies are more successful in attracting FDI. There are also authors that even find prospective growing economies as an important factor for FDI inflow. For example, Sakali, C. (2013) uses panel data to analyse the determinants of FDI in Bulgaria. Her empirical results suggest that prospects of growing economy are one of the important determinants of FDI in Bulgaria.

GDP and GDP growth were also frequently used in gravity models as alternative to host country market size. The basic idea is that similarity of GDPs signifies the convergence in country size which motivates horizontal FDI. According to Markusen, (1998), the production would be located in the country with larger market while the country with

smaller market will be served by exports when there is significant difference in size between these two countries. Markusen takes GDP as an alternative measure of a country's market size. Furthermore, Lahreche-Revil, A. (2006) conducts the empirical investigation using gravity model to investigate where the impact of various definitions of corporate taxation on FDI. One of her findings was positive correlation of GDP (of both host and home country) with FDI flows.

In the recent empirical studies of bilateral foreign direct investment (FDI), Blonigen, B. and Piger, J. (2011) use Bayesian statistical techniques to select a set of variables that are most likely to be determinants of FDI activity. They found out that traditional gravity variables including parent country's GDP, parent-country's per capita GDP, cultural distance factors, relative labor endowments, and regional trade agreements, are significant determinants of FDI. Moreover, Bénassy-Quéré, A., Coupet, M., & Mayer, T. (2005) also confirm that the gravity model is a good and robust empirical description of capital investment movements and they found all standard gravity variables significant at the one per cent level, and correctly signed. Specifically, their findings show that the GDPs of both host and home countries have a positive impact on bilateral FDI.

From available literature about market size and GDP in gravity model, the main conclusion is that GDP can be used as a proxy for market size of the country in gravity model and it should have positive effect on FDI flows.

3.5 Geographical distance and Transport Cost

Based on proximity-concentration hypothesis supported by Brainyard (1997), physical distance can be used as a proxy for transport costs. This hypothesis predicts that firms are

more likely to expand their production horizontally because the longer geographical distance between home and host country the higher transport costs.

Waldkrich examines FDI and physical distance relation where distance has negative effect on FDI. For example, in his paper "Vertical FDI? A host country prospective" measures distance between country capitals as proxy for trade and investment costs. In his other work, "The structure of multinational activity: evidence from Germany" (2010), distance again has negative effect on FDI. Findings of other authors like Blonigen and Davies (2005), Lahreche-Revil (2006) , Benassy-Quere (2005), also confirm the negative correlation between distance and FDI. Eicher, T. and Kang, J. (2003) study factors that determine the entry of multinational companies into host countries using market size, tariffs, transport costs as control factors. Their findings explain why direct investments are concentrated more in larger countries than in middle size countries. The study gives interesting results on tariffs and transport costs. The findings show that these costs are important in determining the entry of foreign investors. Depending on combinations of transport and tariffs costs, firms decide either to entry via direct investment or trade.

Limao and Venables (2001) use different method according to which transport cost is the difference between f.o.b. (data for export as free on board) and c.i.f. (data of importer country for the same trade flow including costs, insurance and freight). This measure has an advantage over geographical distance as it captures the variance in the value of the transport cost over time. Gaulier, G., Mirza, D., Turban, S., and Zignago, S. uses the same measure for transport costs in their paper "International Transportation Costs around the World: a New CIF/FoB rates Dataset", (2008). Esiyok (2010) also considers this measure more appropriate for using in calculation of transport costs in Gravity Model because of its advantage over geographical distance.

3.6 Political stability

Political factors affect to the attractiveness of a host country to the foreign direct investors. Most of the literatures suggest that this effect is positive. There are a number of articles supporting importance of political stability in the country for foreign direct investors. For example, Buthe, T. & Milner, H. (2008) examine the effect of the political factors on the flow of foreign direct investment into developing countries focusing on the international trade agreement - GATT/QTO and preferred trade agreement (PTAs) – as an indicators of stable investment environment. They consider these international commitments more credible than domestic policy choices for measuring the degree of investment environment of the country including its political stability. Their statistical analyses provide strong empirical support for their central hypotheses about the effect of international institutionalized commitments on FDI flows. Particularly, they find out that belonging to the WTO increases inward FDI, and the inward FDI increases when the number of PTAs to which a country is a party is greater. This means, developing countries attract more FDI when joining to international agreements. Also, it is important to mention about this work that when authors include domestic policy measures in their model, they still find that WTO and PTA's have significant positive effect on FDI inflows.

Controversial empirical work was conducted by Haksoon, K. (2010) where he investigated the relationship among foreign direct investment and political stability analyzing the country-level FDI flows, FDI inward performance and political stability measures. He finds out that countries with high level of corruption and low level of democracy have higher FDI inflows and FDI inward performance.

The general conclusion from available literature about effect of political stability on FDI flows is that growing political stability should have positive effect on FDI flows in emerging markets but negative effect on already developed countries.

3.7 Institutional framework

Institutional framework has always been one of important factors which matters to business and organization when entering a new market. In their empirical analyses different authors use different proxies to account for institutional framework. For example Esiyok (2010) use bilateral investment treaties (BITs) between Turkey and home countries as a proxy for investment liberalization which is intuitively correlated with institutional framework. Another author, Carr (2001), uses an index to control for investment liberalization.

In their discussion paper, Busse, M. and Hefeker, C. (2005) study linkages between institutions, political risk and foreign direct investment inflows. They collect the data from 83 developing countries for the time period of 1984 – 2003 to conduct their empirical study. During their analyses, they find indicators for law as very significant determinants of foreign investment flows. Additional study provided by Saul Estrin & Milica Uvalic (2013) indicates on importance of institutional quality and prospects of EU membership in attracting foreign direct investment in Balkans. These authors use two measures to control relationship between institutional background and FDI, namely investment freedom and a quality of property rights protection index derived from the Heritage Foundation's Index of Economic Freedom.

Brindusa Anghel (2005) argues that countries with stronger institutional framework better attract foreign direct investment than those with weaker. Anghel made empirical analyses of cross-section data and found many aspect of institutional framework (protection of property rights, corruption, significant, business restrictiveness and others).

Bissoon, O. (2011) comes to similar conclusions when examining the effect of institutions' quality on determining FDI in a host country. The main finding is that governments can play an important role in promoting FDI via appropriate institutional reforms. Moreover, according to Bissoon, an improvement in institutional quality would increase state's income level which has indirect positive effect on the level of FDI inflows of the country. Earlier, this hypothesis was supported by Rajan, R (2004) who also was emphasizing importance of government policies in creating appropriate environment for FDI.

Mike Pournarakis and Nikos C. Varsakelis (2004) find the market size and the degree of internationalization of the host economy as important factors explaining the uneven allocation of foreign direct investment in the economies. However, they also provide empirical evidence that institutional factors play significant role in explaining the behaviour of foreign direct investment flows in the country. According them, these factors strengthen location advantages and make the economy more attractive to foreign investors.

Cristina Jude & Gregory Levieuge (2013) investigate the effect of foreign direct investment on economic growth conditional on the institutional quality of the host county. They wanted to show hoe the institutional quality causes FDI knowledge spillovers. Using sample of 94 developing countries over 1984-2009 period, they tested their hypotheses and found significant correlation between FDI inflow and institutional quality indicators.

Therefore, their final conclusion is that the institutional framework must be improved to attract more and more foreign direct investors.

3.8 Bilateral Treaties

There are a lot of empirical works on effect of bilateral treaties on foreign direct investment. Mary Hallward-Driemeier (2003) provides empirical analyses of correlation between bilateral treaties and foreign direct investment flows. She finds out that the more treaties are ratified the higher is volume of FDI in a corresponding host country. The paper also indicates that these treaties are complementary to other factors like institutional quality of the country. This leads to further finding that ratified treaties increases the responsibility of local institutions leading to higher institutional quality of the country.

Busse, M., Königer, J. and Nunnenkamp, P. (2008) use larger data sample to test the same correlation. They employ a gravity-type model to test their hypotheses including instrumental variable approach during their research. Their findings indicate on significant effect of bilateral treaties on foreign direct investment inflow. Mina, W. (2010) provides empirical analyses of both short and long term effect bilateral treaties on foreign direct investments in Gulf region. He employs GMM estimation on panel data and finds investment treaties less important than other type of bilateral treaties. In addition, his paper indicates on difference of bilateral treaties' effects that are dependent on the level of county's income.

Christian Bellak (2013) also examines the effect of bilateral treaties on foreign direct investment flows but he uses meta-analysis. His findings show substantial between-study heterogeneity indicating on substantial effect of bilateral treaties on foreign direct

investment flow. Additional work providing meta-analyses on this subject is a study provided by Lars P. Feld and Jost Henrich Heckemeyer (2009). They use a broad set of meta-regression estimators to selecting the most appropriate ones to their analyses. For them it is important to find the best solution, namely, meta-analysis which has real contribution to the study. High emphases are put on studying the effect of variables moderating tax differentials and tax rates set under signed bilateral treaties.

There is also a whole book about the effect of treaties on foreign direct investment by Karl P. Sauvant and Lisa E. Sachs (2009). Specifically, they study the effect of doubles taxation treaties and bilateral investment treaties on FDI. Their main finding is that these two treaties create investor friendly environment which eventually leads to the flow of foreign direct investment. They also note that these findings are still debatable. Therefore they are still subject of further research. This statement has real reasons behind it at least because some of experts in this field doubt the real impact of bilateral treaties in foreign direct investment flow. Also there are evidences from economies of some African countries. For example, Nigeria attracts one of highest foreign direct investment flow in Africa because of its oil resources. This means that foreign direct investment flows to the countries with natural resources and large markets rather to those with higher number of signed bilateral treaties.

3.9 Labour market

There is abundant number of literature on the effect of labour market on foreign direct investment. In the study conducted by Ranjan, V. and Agrawal, G. (2011), labor cost is taken as one of control variables. Ranjan and Agrawal study the determinants of foreign

direct investment inflow specifically in BRIC countries (Brazil, Russia, India and China). The employ random effect model and find labor cost as one of significant variables in the model. Meanwhile, Parcon, H. (2008) studies this subject focusing on labour market regulations. According him, labour market has two effects on foreign direct investment inflow that are opposite to each other. Higher cost of labour has negative effect on foreign direct investment flows but higher cost implies higher quality of labour which has positive effect on investment flows. Therefore, the main finding of the study is that there is certain degree of labour market regulations which makes the country attractive to foreign investors. And there is certain level of these regulations that will have negative effect on foreign investment flow. Also, according him, the effect of regulations depends on a country and sector where foreign direct investment flows.

A different empirical work is provided by Delbecque,V., Méjean, I., and Patureau, L. (2007) that study the impact of labor market institutions on foreign direct investment flows focusing on French firms. They employ a discrete choice model to estimate variables of individual foreign direct investment decisions. Delbecque,V. and his co-authors build their model based on the new trade theory of Krugman with elements of other models covering labor market. As a result of their estimations, they find that the labor market has significant effect on foreign direct investment decisions. The effect varies depending on the type of labor market institutions. According to the authors, stricter labor regulations have negative effect on firms' decisions but the most important determinant of foreign direct investment is the demand in in the market.

Despite abundance of empirical works on the effect of labour market on foreign direct investment, still most of these papers have lots of limitations. Pflüger, M., Blien, U., Möller, J. and Moritz, M. (2010) test different theoretical aspects covering the correlation

between foreign direct investment and labour market. After diligent reviews of some of most relevant literature, they conclude that many of these works have a number of limitations. Therefore, new approach for the research of FDI and labour market relationship is needed.

There are also empirical works that study the opposite effect: the impact of foreign direct investment on labour income. For example, Tintin, C. (2012) studies this subject using panel data analyses over fourteen OECD countries for the time period between 1990 and 2010. He focuses on labour income as a proxy. Specifically, he studies the impact of foreign direct investment on different classes of labour. Tintin finds out that foreign direct investment has positive effect on labour income (on minimum and maximum wages) in OECD countries. Similar work is provided by Pandya, S. (2010). She focused on demand for foreign direct investment in host countries. According to her findings, foreign direct investment preferences depend on its impact on income. As foreign firms increased wages for skilled workers, support for these firms increase as labour skills become higher in a host economy. Using data from eighteen Latin American countries, the authors finds support for her hypotheses.

4. Conceptual framework and methodology

4.1 Conceptual Framework and Hypotheses

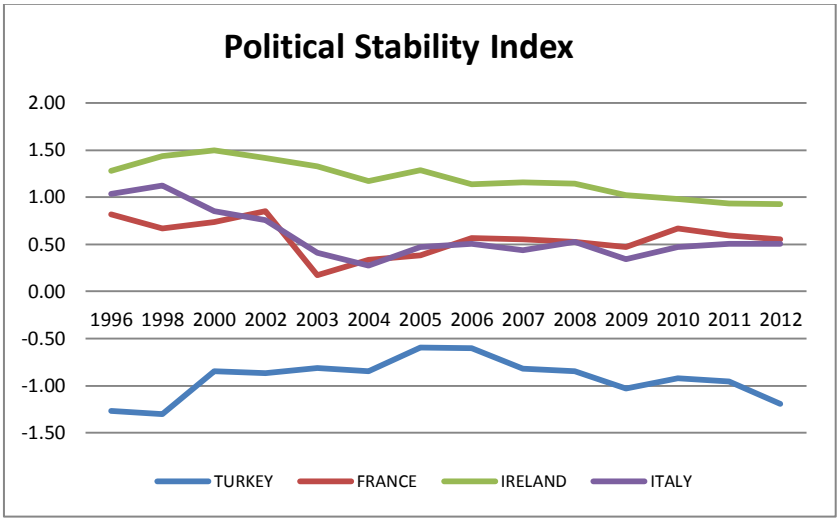
I employ a knowledge-capital framework (Markusen et al., 1996) to find FDI determinants in Turkey. I follow Esiyok (2010) who covered the main determinants of FDI inflows in

Turkey that had not been covered by previous authors like Kayam (2009) or Central Bank of Turkey (2013).

Hypothesis #1: Political stability in the country attracts higher volume of FDI.

Political stability in Turkey had improved since 2002 due to active policies of the new government. This fact maybe is one of the main determinants of FDI inflow to Turkey in the last 10 years. [On other hand increasing disturbance in the region (like "Arab spring") may deteriorate political stability environment of the country]. A number of authors support the fact that political stability has positive effect on FDI inflow. Buthe, T. & Milner, H. (2008) consider international institutionalized commitments (like WTO, PTAs) as guarantee of political stability in the country. They found out that developing countries attract more FDI when joining to international agreements. Bissoon, O. (2011) finds positive effect between institutions' quality on FDI inflow of a host country. I am going to use World Bank's political stability index as Haksoon, K. (2010) when investigating the relationship among foreign direct investment and political stability. It measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. Estimates of this measure range from -2.5 (weak) to 2.5 (strong political stability) points. From the data for political stability index in Turkey we see slight improvement in index since 2000 years but still the index has a negative sign. This means that although political situation in Turkey for last 10 years has improved, its political environment is still not as good as in western European countries.

Figure 7. Political stability in Turkey between 1996 and 2012



Soucre: based on data compiled from World Bank Governance Indicators

Also, I take into account controversial empirical findings of Haksoon, K. (2010). This means, that maybe improving political stability of Turkey is attracting more and more FDI but because it is not as good as in Western Europe, it may be also positive signal for foreign investors. Therefore, The expected effect of political stability variable can be both positive and negative.

Hypothesis #2

Higher level of education attracts FDI into the country

Countries with a high level of education tend to attract higher levels of foreign investment than those with low level of education. There can be found several studies supporting this hypothesis. For example, Akin, M. & Vlad, V. (2011) find out that superior education is important determinant in FDI. From the most recent works on correlation between education and FDI are papers of Donaubauer, J. Herzer, D. (2013) and Bahmaid , S. (2013). Donaubauer, J. and Herzer, D. (2013) tested the hypothesis that aid for education is an effective means to increase FDI

flows to host countries in Latin America where schooling and education appears to be inadequate. One of their findings was the positive correlation between FDI and education. Similar findings are made by Bahmaid , S. (2013). She finds that investments in educational sector in India increase FDI inflows of the country.

Based on made research and general intuition, the expected effect of education on FDI is positive. In my paper, I take the share of GDP dedicated to the Ministry of Nation Education as a proxy for educational level assuming that every invested penny to education improves its level.

Hypothesis #3: Similarity between countries sizes increases FDI between them

Production would be located in the country with larger market while the country with smaller market will be served by exports when there is significant difference in size between these two countries. GDP can be taken as a measure of a country's market size. Hence, as similarity of GDPs signifies the convergence in country size which motivates horizontal FDI, the expected sign of the variable is positive (Markusen, 1998)

Similarity index is calculated using formula derived by Helpman, E. (1987):

Simindex= $1 - (\frac{GDP_{it}}{GDP_{it}+GDP_{ht}})^2$-$(\frac{GDP_{iht}}{GDP_{it}+GDP_{ht}})^2$, *where "h" stands for Turkey and "i" for other countries.*

Simindex ϵ *(0;0.5). Values close to 0.5 shows high similarity in country size; values closet to 0 – high difference in country size.*

This formula gives similarity index which will be used to get similarity: Similarity=lnSimindex.

Hypothesis #4: Higher trade costs of firms motivate them to switch to FDI.

Waldkrich (2003) measures distance between country capitals as proxy for trade and investment costs. According to him, it should be included in the model since it fits well for gravity-type models. However, taking just distance as a proxy for trade cost would not be sufficient therefore as Esiyok (2010) I decided to include CIF/FOB ratios as a proxy for transportation/trade costs. More support for this choice of ratio, I find in an empirical paper "International Transportation Costs around the World: a New CIF/FoB rates Dataset", by of Gaulier, G., Mirza, D., Turban, S., and Zignago, S. They find CIF/FOB ratio similar to alternative proxy measures of transport cost but they highlight the advantage of it in capturing variation over time and products.

Hypothesis #5: Better institutional framework of a country would increase its inward FDI

Intuitively, firms prefer to work in well-known environment than in totally unknown. This means that rule of law/ or law enforcement, institutional framework, and business/economic environment of a host country matter when a foreign firm wants to enter to a host country. Therefore, it is important to include in the model at least one of these mentioned factors. Esiyok (2010) included a variable for investment liberalization (in Turkey) using bilateral investment treaties (BITs) between Turkey and home countries as a proxy. Carr (2001) also used an index to control for investment liberalization.

I decided to include a variable for the law enforcement/rule of law motivated by the empirical work on determinants of FDI in Balkan countries by Saul Estrin & Milica Uvalic (2013). During their research, Estrin and Uvalic found institutional quality and prospects of EU membership as important determinants of foreign direct investment in Balkans. These authors used two measures to control relationship between institutional background and FDI, namely investment freedom and a quality of property rights protection index derived from the Heritage Foundation's Index of Economic Freedom.

In my empirical analyses I use Rule of Law index derived from World Bank governance indices. The index reflects to what extent market actors are confident about the law enforcement and abide by the rules of society. Specifically, the index shows the quality of how contract terms and property rights are respected in the country. (It also includes the quality of the police and courts activity, as well as the likelihood of crime and violence.) Estimate of Rule of Law ranges from -2.5 (weak) to 2.5 (strong), hence the higher the figure the higher the degree of Rule of Law. Therefore the expected sign of the variable is positive if the index estimates increase over last years (institutional framework had improved over the last years) or vice-versa.

4.2 Methodology

I am going to specify a panel model with cross section dimensions (home countries "i",i=N number of countries, and the host country Turkey "h" and time dimension "t", K years, to test the above mentioned hypotheses.

The model will be specified as a gravity model as it contains variables such as trade cost between two countries and market size of two countries

$lnFDI_{hit} = \beta_1 PSTAB_{ht} + \beta_2 lnSim_{iht} + \beta_3 TC_i + \beta_4 EDU_{ht} + \beta_5 LAW_{ht} + \varepsilon_i$, where

lnFDI – log of inward FDI data to Turkey

PSTAB - political stability of a host country at time "t"

LnSimIndex – log of similarity index of GDPs of a country (i) and the host country

TC - trade costs of exports from country (i) to the host country (Turkey).

EDU – education level of host country at time "t"

LAW - rule of law in the host country (Turkey)

I want to estimate the determinants of FDI in Turkey with larger data sample and specific time period of 2001-2012, when a lot of foreign investments were attracted to the economy. Thus I will be able to test if similarity Index, political stability and trade cost are indeed one of significant FDI determinants in Turkey. In addition, I add two new variables - education level and rule of law - based on my literature review which emphasis the significance of education and law enforcement level as FDI determinants.

Since my data represents both cross sectional and time series data, I will employ panel data analyses. First I want to use pooled OLS model which pools all the observations in OLS regression implicitly assuming that the coefficients are the same for all the individuals. But estimates from pooled OLS regression will be biased and inconsistent once pooled OLS neglects heterogeneity across individuals so that the effects unique to every individual will be absorbed by error term. Therefore, fixed and random effects

models will be employed further in my estimations to conduct a panel data analyses. These models are especially useful when analyzed number of countries is larger than the observed time period as in my panel data (25 countries for 11 year period).

5. Data description

Following my hypotheses, I collected the required data that will be used in my estimations. My observations will cover only time period between 2001 and 2012 featuring top 25 countries that have directly invested in Turkey during this time period. It includes both OECD and non OECD countries that were not covered by previous studies including Esiyok's. Countries included in the data are: Austria, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Spain, Sweden, UK, Canada, Japan, Republic of Korea (South Korea), Norway, Switzerland, USA, Belgium, Ireland, Luxembourg, Russian Federation, Bahrain, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, Azerbaijan.

For the purpose of my research, I use knowledge capital model to estimate FDI determinants in Turkey using Political Stability, Similarity, Trade cost, Education level and Control of Law as control variables. Similarity index (LnSimIndex) was derived from log of SimIndex= $1 - (\frac{GDP_{it}}{GDP_{it}+GDP_{ht}})^2$-$(\frac{GDP_{iht}}{GDP_{it}+GDP_{ht}})^2$. Total GDPs (in US dollars) for each observed country (and Turkey) was extracted from United Nations statistics division (UNSTAT,unstats.un.org). After the calculation, the log of SimIndex was extracted to get final data for lnSimIndex variable. The data for Trade Cost variable was calculated as

cif/fob using import and export data of home country to the host country (Turkey) extracted from UN Comtrade databse (comtrade.un.org).

Table 1. Descriptive statistics

	TC	LnSimIndex	LnFDI	PolStab	Educ	Law
nbr.val	348	348	348	348	348	348
nbr.null	1	0	73	0	0	0
nbr.na	0	0	0	0	0	0
Min	0	-3.187	0	-1.192	1.68	-0.0609
Max	34.93	-0.693	8.65	-0.597	2.88	0.1571
Range	34.93	2.494	8.65	0.595	1.2	0.218
Sum	982.68	-414.498	1223.57	-299.454	825.92	22.7795
median	1.48	-0.899	3.91	-0.8445	2.35	0.0804
Mean	2.82	-1.191	3.52	-0.8605	2.373	0.0655
SE.mean	0.25	0.034	0.13	0.0084	0.017	0.0037
CI.mean	0.5	0.066	0.26	0.0165	0.033	0.0073
Var	22.09	0.392	6.04	0.0245	0.096	0.0048
std.dev	4.7	0.626	2.46	0.1565	0.309	0.0692
coef.var	1.66	-0.526	0.7	-0.1818	0.13	1.0573

The data for the share of GDP dedicated to the Ministry of Nation Education (taken as a proxy for education level in Turkey) is extracted from the report of the National Education Statistics of the Ministry of Nation Education (www.meb.gov.tr).

The data for Political Stability and the Rule of law indicators for the host country was extracted from World Bank Governance indicators (WGI). It is a research dataset that summarizes the views on the quality of governance gathered from several survey institutes, think tanks, non-governmental and international organizations and even private firms. The data is provided by various survey respondents (enterprise, citizen and expert) from different countries.

Thus, the Political stability index reflects the probability of the government destabilization that may happen as a result of unconstitutional or violent actions. Therefore, it should be a

good indicator to control for political stability of the host country (Turkey) over the last 10 years.

Rule of law reflects the extent of market actors' confidence about the law enforcement and the level of their abiding by the rules of society. Specifically, the index shows the quality of how contract terms and property rights are respected in the country. (It also includes the quality of the police and courts activity, as well as the likelihood of crime and violence.)

The dependent variable lnFDI is log of inward FDI data (reported in US dollars) to Turkey from all 25 countries present in the sample. The data was extracted from OECD statistics office (stats.oecd.org).

6. Empirical results

To conduct my empirical calculations I used R software. R is a platform for statistical computing (linear and nonlinear modelling, classical statistical tests, time-series analysis, clustering and other tools) and graphics developed at Bell Laboratories by John Chambers and his colleagues.

As a first step, I used pooled OLS model for my estimations, then continued with estimations of Random Effect and Fixed effect models. Following estimations, I conducted different tests (Breusch-Pagan Lagrange Multiplier test, Hausman test) to check which model is the most suitable for the estimations. This was followed by other tests to check consistency of derived results.

POOLED OLS

Pooled OLS model ignores panel structure of the data. Namely, the model takes all the data from time series and cross sectional dimensions as the combinations of separate observations.

$$Y_{it} = \beta_0 + \beta_1 X_{it} + u_{it}$$

Pooled OLS model brings more efficient estimations giving more relevant and unbiased estimates. It helps to test more sophisticated models allowing less restrictive assumptions. Panel data sets make it possible to control for individual heterogeneity. They are able to identify and estimate the regression effects that cannot be found either in cross-section and time-series data. Pooled OLS model is able to detect dynamic behavior of variables in panel sets. However, if there is no mean to control the regression effects in the panel data then estimations from pooled OLS model will be biased and inconsistent.

In short, when we have a Panel data we are usually interested in heterogeneity across individuals, keeping time dynamics. Now we would like to understand the differences in behaviour across individuals. Thus, our general framework takes the form of:

$$y_{it} = x'_{it}\beta + z'_i\alpha + \varepsilon_{it}$$

Where heterogeneity or individual effect is captured by $z'_i\alpha$. Thus, if z_i contains only constant term, OLS provides consistent and efficient estimates. As a next step, I run the Pooled OLS in R that takes the following form,

$\ln FDI_{hit} = \beta_0 + \beta_1 PSTAB_{ht} + \beta_2 \ln Sim_{iht} + \beta_3 TC_i + \beta_4 EDU_{ht} + \beta_5 LAW_{ht} + \varepsilon_i$,

and I get the following estimations depicted in the table below (Table 2):

Table 2. Estimations of Pooled OLS model

Pooled OLS model					
	Estimate	Std. Error	t-value	Pr(>|t|)	
(Intercept)	-2.8882	1.0381	-2.78	0.0057	**
LnSimIndex	0.0135	0.1946	0.07	0.9445	
TC	-0.0785	0.026	-3.02	0.0027	**
PolStab	2.8602	1.0756	2.66	0.0082	**
Educ	3.9773	0.596	6.67	1E-10	***
Law	-5.1347	2.2621	-2.27	0.0238	*
R-Squared	0.161				
Adj. R-Squared	0.158				

The results show that all the explanatory variables are strongly significant, except the similarity index. The most significant parameter is the one for the level of education – at 99% confidence level. Parameters of trade cost and political stability are significant at 95 % confidence level, and rule of law - at 90 % confidence level. The signs for political stability and level of education are positive and for trade cost is negative as expected. The surprising is the sign for Rule of Law which is negative.

R-Squared is 0.161. Hence this model explains 16.1 % of the variation in foreign direct investment inflow to Turkey. If we look at adjusted R-squared which is 0.158, then the fit will be almost the same – the model explain 15.8 % (very close to R-squared) of the variation in FDI inflow to Turkey.

RANDOM EFFECT MODEL

Random effect model is the model where the constant term is random assuming that the individual effects (that are captured by constant) are not depended on independent variables. The intercept in this model (which acts here as a random variable) represents the sum of the means and corresponding error term.

This model suits more to the cases when the number of observed units is large and the regressed variables are time-invariant. Thus, Random effect model will give more reliable results than fixed effect model when there is the sample data (time invariant) with large population. When the estimated parameters are random variables, the model saves certain degrees of freedom.

Table 3. Estimations of Random Effect model

Random Effect model					
	Estimate	Std. Error	t-value	Pr(>|t|)	
(Intercept)	-2.5456	1.0324	-2.47	0.0142	*
LnSimIndex	0.145	0.4307	0.34	0.7366	
TC	-0.1145	0.0351	-3.26	0.0012	**
PolStab	2.8696	0.8389	3.42	0.0007	***
Educ	3.9395	0.4668	8.44	9.1E-16	***
Law	-4.93	1.7713	-2.78	0.0057	**
R-Squared	0.232				
Adj. R-Squared	0.228				

The drawback of the random effect model is that it ignores any correlation of error terms from all units of cross section with other independent variables. Empirical analyses show that the opposite effect has higher probability to happen. Therefore, estimations from

random effects model will be biased if the opposite effect take place as the basic assumption of no correlation is violated.

Results of estimation (Table 3) show that all variables are significant except similarity index (as in the case of pooled OLS model). None of the variables was excluded from the model. Hence all variables are uncorrelated with disturbances. Random effect model gave different sizes and significance of estimates but same signs to the estimates as in pooled OLS model. Trade cost and political stability have less effect on FDI in this model than in pooled OLS model, while the effect of institutional framework and expenditure on education is higher. The most significant parameters are for variables of education level (at 99% confidence level) and political stability (at 99% confidence level). Parameters for Trade cost and Rule of Law are significant at 95 % confidence level. As in estimated results of pooled OLS model, positive signs of political stability and level of education were expected. However negative signs of institutional framework (rule of law) and trade cost were not expected.

The standard errors decreased in comparison to pooled OLS model, implying that the estimates from random effects model more efficient. R-Squared is 0.232 Hence this model explains 23.2 % of the response data. If we look at adjusted R-squared which is 0.228, then the fit will be almost the same – 22.8 % (very close to R-squared.) As R squared in the random effect model is higher than in pooled OLS, we may say that Random effects model fits better to the estimations than pooled OLS model. However, to confirm our assumption we need to conduct the Breusch-Pagan Lagrange Multiplier test which will be provided later.

FIXED EFFECT MODEL

Fixed effect model as well as random effect model is usually used when the observed number of countries is large while the observed time period is short. The fixed effect model will give more efficient results if the data of the whole population is available. The model itself allows individual specific effect to be correlated with independent variables demeaning these repressors by within transformation to remove v_i :

$$\overline{Y}_i = \beta_1 \overline{X}_i + v_i + \overline{\mu_i}$$

$$Y_{it} - \overline{Y}_i = \beta_1 \left(X_{it} - \overline{X}_i\right) + (v_i - v_i) + (\mu_{it} - \overline{\mu_i})$$

Panel data is usually known for its heterogeneity problem. It can be solved if we remove v_i as assumption of no correlation between v_i and X_{it} will not be needed anymore. However, if v_i and X_{it} are not correlated then the fixed effect model will not give efficient estimates. The key advantage of the fixed effect model is that the time-invariant variables are not included.

In my case, fixed effect model is probably the most suitable estimator as all data in my dataset is varying in time. As a next step I did estimations in R using the following formula and got the results shown Table 4.

Fixed effect model eliminated the unobservable effects in the model effects since estimation within this model is based on within-panel over-time variation. It can be simply explained / shown in the following formula:

$y_{it} = x'_{it}\beta + c_i + \varepsilon_{it}$, where E[ci|Xi]≠ 0,

$c_i = z_i'\alpha$ is a group-specific constant term that contains all observable effects where z_i is unobserved but correlated with x_{it}.

Table 4. Estimations of Fixed Effects model

Fixed Effects model					
	Estimate	Std. Error	t-value	Pr(>|t|)	
LnSimIndex	0.9154	1.0781	0.85	0.39646	
TC	-0.1334	0.0403	-3.31	0.00105	**
PolStab	2.8573	0.8401	3.4	0.00076	***
Educ	3.8549	0.4767	8.09	1.3E-14	***
Law	-4.7912	1.7774	-2.7	0.0074	**
R-Squared	0.248				
Adj. R-Squared	0.224				

Results of estimation show that all estimates are significant except similarity index (as in all previously estimated models). Although signs of estimates haven't changed, their sizes and significance in the fixed effect model are different from sizes and significance of estimates in the random effect model. Effects of all variables on explanatory variable are higher in the fixed effect model than in Random effect model.

The most significant parameters are those for variables like education level (at 99% confidence level) and political stability (at 99% confidence level). Parameters for Trade cost and Rule of Law are significant at 95 % confidence level. Also, the standard errors (for significant estimates) in fixed effect model are less compared to standard errors of estimates in the random effect model. This means that the estimates from fixed effects model are more efficient than estimates from random effect and pooled OLS models.

Positive signs of political stability and expenditures on education were expected as well as negative sign of trade costs. Increasing political stability, higher level of education and decreasing trade cost indeed should have positive effect on foreign direct investment inflow. However negative sign of institutional framework (rule of law) was not expected as it should be as one of important factors for investors (the same results were obtained in previous models – in Pooled OLS and Random effect models). However, there is also other point of view according which investors sometimes benefit weak institutional framework as they find it as an opportunity to enter the market without strict legal barriers.

R-Squared is 0.248. Hence this model explains 24.8 % of the variation in foreign direct investment inflow to Turkey. If we look at adjusted R-squared which is 0.224., then the fit will be a bit less – in this case, the model explains 22.8 % of the variation in FDI inflow to Turkey. R squared in the fixed effect model is higher than R-squared in Random effect model and hence than in pooled OLS. Therefore, based on results for goodness of fit, we may say that fixed effects model fits better to the estimations than Random effect model and pooled OLS model. However, adjusted R-squared is less a bit (for 0.4 %) than in Random model, which brings us to opposite conclusion – random effects model fits to the estimations better than fixed effect model. Nevertheless, to check these assumptions we need to conduct the Hausman test which will also be provided later.

Model Choice

The results for fixed effect tests show that there are significant panel effects, specifically in this case – fixed effects model better fits for my estimations than pooled OLS model.

In addition, I conduct Breusch-Pagan Lagrange Multiplier for random effects where the null hypothesis is that variances across entities are zero. This means that there is no significant difference across units (i.e. no panel effect) hence pooled OLS model is better.

Breusch-Pagan Lagrange Multiplier for random effects just confirm the results of testing for fixed effects: there are significant panel effects in the model therefore random effects model better fits my calculations than simple pooled OLS model.

At last, I conduct Hausman test to find out which of models (fixed or random) better fits to my estimations. The results of the test show that random effect model is better choice than fixed effect model. But the random effects model suits more to the cases when the number of observed units is large and the regressed variables are time-invariant. In this paper, the used data was large it was varying over time. Hence, the random effect model will not give more reliable results than fixed effect model.

Contrary to the random effects model, the fixed effect is most suitable when observed number of countries is large while the observed time period is short and the variables are time-variant. Therefore, it is more reasonable to employ the fixed effect model in my estimations as all my data is time-variant.

Tests

Cross-sectional dependence/contemporaneous correlation

Although cross-sectional error dependence used to be considered in only spatial models, it had recently become important issue also in panel data. The availability of data has been growing over time and nowadays usually panel includes lots of information across

countries, industries, sectors (and etc.), where cross section dimensions is larger than time series. Cross sectional correlation of errors can be ignored (once it is present in the data) as this can bring to some problems in analysis of estimations. It is present almost in all panel data from economics.

Usually, cross sectional correlation of errors can be caused by different factors: it can be a result of omitted spatial effects or it is just caused because of exogenous common shocks. In fixed and random models estimators, presence of cross-sectional dependence can lead to wrong inference or even inconsistent estimators. It depends on nature of the error. For example, it must be found out if the source of generating the cross sectional dependence is correlated with independent variables or not.

Thus, it is important to test if the cross-sectional correlation is present in my data or not. Therefore I ran Pasaran CD test to check whether the residuals are correlated across entities. Under the null hypothesis in the Pasaran CD test, residuals across entities are not correlated. The results of the test show that the null hypothesis is rejected at 99 percent confidence level (see appendix) Thus, there is cross sectional dependence in my data.

Testing for serial correlation

One of the assumptions of regression analyses is that error terms are uncorrelated - independent from one another ($E(\varepsilon_i \varepsilon_j) = 0$ for all $i \neq$ j). If this assumption is violated, alternative estimation model should be employed compromising on the efficiency of the estimates. The most common case of such violation occurs with time series data in the form of serial correlation. In time series this occurs when the error in period has an effect

on the error in a subsequent period. If serial correlation in idiosyncratic errors exists, estimation would be less efficient and standard error will be biased.

Panel data contains both time series and cross sectional data, therefore serial correlation can occur in that data as well. Because my data is a panel data I decided to check for existence of serial correlation in my estimations. Therefore I used Breusch-Godfrey/Wooldridge test to check for serial correlation where the null hypothesis is that there is no serial correlation in the data. The results of the tests showed that the null hypothesis of no serial correlation is rejected 99 percent confidence level (see appendix). Therefore it can be inferred that my estimations are less efficient and standard error are biased.

Testing for heteroskadesticity

Even if heteroskadesticity is present in the estimations, the coefficient estimates in the ordinary least squares will not be biased but estimates of its variance. Therefore, the variance and standard errors of ordinary least squares estimates will possibly be above or below the population variance. Hence, although regression analysis of heteroskedastic data gives unbiased estimates for correlation between the dependent and independent variable, the biased standard errors will lead to probably wrong inferences and thus wrong final results. Considering these issues I used the Breusch-Pagan test to check for heteroskadesticity in my estimation where null hypothesis is that the estimation is homoscedastic (and alternative hypothesis tells that the estimation I heteroskedastic). The results of the test show that the null hypothesis (homoscedasticity) is rejected with p-value = 0.07974 - heteroskadesticity is detected in the estimation. Hence our estimations of

coefficients are not biased but there is bias in standard errors that may lead to wrong inferences.

Controlling for Heteroskedasticity and serial correlation

In order to account for the problems that were found in my estimations, I used robust covariance matrix with "arellano" which gives both no serial correlation and heteroskadesticity consistent coefficients. After conducting the testing, all independent variables were found significant except similarity index.

Table 5. Controlling for Heteroskedasticity and serial correlation

	Estimate	Std. Error	t-value	Pr(>|t|)	
LnSimIndex	0.9154	1.3491	0.68	0.49795	
TC	-0.1334	0.0214	-6.23	0.00000000149364	***
PolStab	2.8573	0.8757	3.26	0.00122	**
Educ	3.8549	0.5159	7.47	0.00000000000079	***
Law	-4.7912	1.4134	-3.39	0.00079	***

1 % increase in similarity index will increase foreign direct investment in Turkey by 0.916 %. However the estimate is not significant at all. This means that similarity in income of economies does not play significant role in FDI inflow to the host country.

The effect of Trade cost on foreign direct investment is negative. If trade cost increases by 1 ratio it will result in decrease of FDI by 13.34%. The estimate is significant at 99%

confidence level. Such result was not expected and therefore the reason behind it must be identified in the next chapter.

The political stability is represented as a range between -2.5 and 2.5, therefore the probability of this range will equal 100% in total (cumulative distribution function). From this we interpret our estimation as follows: if there is one positive standard deviation change in political stability index, the foreign direct investment will increase by 2.86%. The estimate is significant at 95% confidence level.

Similar to political stability index, the rule of law index is also represented as a range between -2.5 and 2.5, therefore the probability of this range will equal 100% in total (cumulative distribution function). Thus I have similar interpretation as for political stability index: one positive standard deviation change in rule of law will cause foreign direct investment in Turkey to decrease by 4.7912 %. The estimate is significant at 99% confidence level.

At last, 1 % rise in level of education in Turkey will attract 3.85 % more FDI to the country. The estimate is significant at 99% confidence level. This finding is in line with my hypothesis which was derived from empirical findings of other authors. This implies that education level plays significant role in attracting foreign direct investors to the host country.

Empirical implications

Estimate of political stability was found significant at 95% confidence level. It has positive effect in foreign direct investment inflow which is in line with my first

hypothesis. This means that increasing political stability in Turkey over last 10 years has been attracting foreign direct investors. Esiyok also had found positive relationship between political stability and FDI inflow. Therefore, political stability is one of important determinants of FDI inflow in Turkey. This implies that for the foreign investors political stability in the host country plays significant role in decision making. Although some authors like Haksoon (2010) may argue that political instability is a good green signal to invest for foreign investors at some point, there is no enough proof for such assumption. To the contrary, empirical analysis including my estimations and also general sense /or economic intuition indicates to significance of increasing political stability for attracting investment.

Education level also has been found significant at 99 % of confidence level and it has positive effect on dependent variable as it was expected. Therefore, second hypothesis is also confirmed. This implies that improving education attracts more foreign investors to the host country – Turkey. This finding is in line with findings of other authors like Akin, M. & Vlad, V. (2011), Donaubauer, J. Herzer, D. (2013) and Bahmaid , S. (2013). This finding is important also because it was not taken into account neither by Esiyok (2010) or other known authors doing empirical analyses of FDI determinants in Turkey.

After conducting all necessary estimations, I didn't find similarity index significant. Esiyok (2010) also had the same result for similarity index. Therefore similarity in national incomes between home countries and the host country (Turkey) has no real/significant impact on foreign direct inflow in Turkey. Hence, my third hypothesis was not confirmed.

Next hypothesis was that increasing trade cost between home country and host country motivated firms to switch to foreign direct investment. It also had not been confirmed, as

the opposite correlation was found. Contrary to the findings of Esiyok, the trade cost of exporting to Turkey has negative effect on FDI inflow to Turkey. Esiyok's explanation of positive correlation was that once multinational enterprises find trade cost of exporting very high, they decide to establish their branch/factory in the host country (it is one of reasons given by Esiyok). Different effect in my finding is probably caused by the use of different time period and larger number of countries used in the sample. There is also good explanation behind this finding – some foreign investors lose interest in the host country as trade cost between these countries becomes higher. This explanation doesn't contradict to the findings of Esiyok. We should take into account the differences in the industries and business/trade politics of foreign direct investors. Multinational enterprises may establish a factory in Turkey for various reasons: it can establish it to export produced product to a third country or back to the home country. In the first case, Esiyok's findings are more suitable: when a firm finds higher cost exporting its goods to Turkey, it decides to establish a fabric to produce its products for local market (Turkey) or to export them further to the east (or west). But if the firm wants to establish a fabric in Turkey to import its products to the home country for various reasons - to sell them directly or use them as input for its production at home – then probably higher cost of trade between a home country and a host country will decrease interest of this firm in investing for a particular country. This issue should be the subject of further research where foreign direct investment flow will be analyzed on firms' level rather than on country level.

At last, it was found out that institutional framework (the rule of law) plays significant role in determining foreign direct investment inflow to Turkey. However the finding was surprising, the effect was opposite - better institutional framework/rule of war makes the country less attractive to foreign investors. These findings are not in line with my last

hypothesis. Meanwhile it is important to mention that Esiyok (2010) took political stability and institutional framework as one variable, contrary to what I did. I have two different indices because in my paper institutional framework is more about law enforcement, property rights, copyrights and business code while political stability is about probability of the government destabilization that may happen as a result of unconstitutional or violent actions. Political destabilization should not necessary account for weak rule of law, especially in the case of Turkey (maybe with the case of an African country it could be true correlation). Rule of law in the host country is important to foreign investors as they want to be confident in their rights for their products, knowledge and other important details of business. However, from this finding we may assume that at some point stronger institutional rule of law may be less interesting to foreign investors – some of them find weak institutional framework as an easy opportunity to enter to the market. Of course it varies from country to country – maybe in some other Asian or African country weaker institutional framework is not acceptable for an investor as they are protected neither from political instability nor from legal institutions.

A similar point was made by David Fagan (2008) in his report to US Chinese services group. According him, the regulatory and institutional framework may either attract or restrict foreign direct investment in the United States. He notes that the effect of institutional framework depends on the characteristics of the investment and certain circumstances. Namely, it depends on the form and nature of the transaction – whether it is an acquisition of assets, and acquisition of merger, an acquisition of majority or minority of shares, greenfield or brownfield investment. He points out on specific factors that have impact on market entry of foreign investors: the sector or industry of the investment, the size of the investment and the location itself. Fagan also indicates the

importance of the specific facts of a particular transaction and the characteristics of the transaction parties in FDI inflow.

7. Conclusion

7.1 Concluding remarks

Since 2002, Turkish Economy had started recovering from 2000/2001 crises through economic and regulatory reforms that improved Turkish economy's resilience to shocks. A set of structural reforms undertaken in the banking sector and a lot of various policies conducted in the area of enterprise restructuring, privatization, trade liberalization, labor market and business environment boosted Turkey's foreign and domestic investments, increased labor productivity thus inducing economic growth. Along with economic stability, political stability had emerged in Turkey since 2001-2002. A new government had invested heavily in improvement country's education level, transport system, and manufacturing. Also a lot of attention was paid to legal system and business code.

These facts played an important role in attracting foreign direct investment in the country. In my paper I wanted to check some of these factors empirically. Namely, I wanted to test the effect of political stability, education level, institutional framework (rule of law) and trade cost on FDI inflow to Turkey. Inspired by similar analyses of Esiyok (2010), I set several hypotheses and employed knowledge capital model to test them after collecting relevant data. As a part of knowledge capital model, I also included similarity index into my model.

My estimations show that increasing political stability and educational level have positive effect on the FDI inflow to Turkey while improving institutional framework and trade cost - negative effect. Although signs of the last two variables were surprising but they had certain explanation behind them. It was inferred that weaker institutional framework can be perceived by investors as an opportunity easily to enter to the country. But this may not be the case in another country. Whether institutional framework has positive or negative effect on FDI inflow depends on the environment of the host country and the characteristics of investing firm itself.

The same with the trade cost – although there are findings where increasing trade cost motivates firms to invest in the host country, it had negative effect in my findings. Again, this implies that whether higher trade cost will motivate firms to switch to FDI or not depends on the nature of investing firm's business, its strategy and other characteristics. For example, if it wants to establish a branch in Turkey to produce some product that will be its input for other production in its home country, then most probably it will not be willing to invest in Turkey as trade cost between its home country and Turkey becomes higher.

At last, similarity index was found insignificant, implying that similarity in national incomes between home countries and the host country (Turkey) has no real impact on foreign direct inflow to Turkey. The result is not surprising since it just confirms the same finding by Esiyok (2010).

7.2 Limitations of study and further research

My model was designed to test the determinants of FDI in Turkey I believe the selected variables were good as they were derived based on empirical findings of other authors. However, to provide more decent estimations, alternative data sources could be used for the selected variables to confirm final estimations. Also, the model could be extended to some more variables. Nevertheless, these are just basic limitations that can be present in any empirical work.

The results of estimations were surprising and led me to rethink about employed technique and model. For example, the trade cost had negative sign which was not expected initially. It was inferred that because foreign firms investing in Turkey are not identical and have different production, business strategy, firm vision (and etc.), they may perceive increasing trade cost differently. Esiyok (2010) found that increasing trade cost motivates firms to switch to FDI while in my findings the opposite trend was found – firms loose interest in switching to FDI in Turkey. Of course, possible explanation for the differences in data could be caused by larger data and different time period, but the real reason probably is another factor. Such studies must be extended to a different point where FDI determinants will be tested on firms' level. It could make clear when trade cost have positive or negative effect on FDI inflow.

Also negative effect of institutional framework (rule of law) on FDI inflow was unexpected. Possible explanation is that for some firms higher institutional framework could be disadvantage as it can create a lot of bureaucratic barriers to enter to the market. Including additional or alternative variables accounting for institutional framework less likely could solve the issue. As in case of trade cost, this issue could be solved if

estimations were made on firms' level rather than in country level. Investing firms could be divided into groups based on their nature of business, sector, and other characteristics. This could give more precise understanding of FDI behavior.

Similar points were made by other authors too, for example by David Fagan (2008) and Tidiane Kinda (2008). Fagan points out on importance of specific factors determining foreign direct investment in the host country: the sector or industry of the investment, the size of the investment and the location itself. Fagan also indicates the importance of the specific facts of a particular transaction and the characteristics of the transaction parties in FDI inflow. Kinda (2008) tried to analyze foreign direct investment determinants at firms' level. Using firm level data for 77 developing countries, she provided empirical evidences of significant correlation between investment climate and foreign direct investments in developing countries. Specifically, she found out that the quality of physical and financial infrastructure defines the level of investments from a foreign firm. Her work was distinct from previous papers because she found difference between exporter and non-exporter firms in their investment behavior. The results of her analyses show physical infrastructure is an important factor for firms supplying foreign markets while financing constraints are main determinants in decision making of foreign firms supplying local markets.

These findings show importance of analyses at firms' level. Therefore, next study regarding FDI inflow in Turkey (also other countries was well) must be conducted on that level. Although it will be more time consuming and a lot of data demanding work, estimations will be more understandable and easy to analyze. Also, such studies can make breakthrough in learning and understanding not only foreign direct investment flows but also international trade as well.

Core Bibliography

Akin, M. & Vlad, V. (2011). "The Relationship between Education and Foreign Direct Investment: Testing the Inverse U Shape" European Journal of Economic and Political Studies, 4(1), 27-46. Retrieved from: http://ejeps.fatih.edu.tr/docs/articles/116.pdf

Anghel, B. (2005). "Do Institutions Affect Foreign Direct Investment?" Universidad Autónoma de Barcelona. Retrieved from: http://idea.uab.es/abrindusa/research/paper_FDI_and_institutions.pdf

Brooks, C. (2008). *Introductory Econometrics for Finance.* New York: Cambridge University Press.

Bénassy-Quéré, A., Coupet, M., & Mayer, T. (2005). Institutional Determinants of

Foreign Direct Investment. CEPII,. Retrieved from: http://www.cepii.fr/PDF_PUB/wp/2005/wp2005-05.pdf

Bénassy-Quéré, A., Coupet, M., & Mayer, T. (2007). Institutional Determinants of

Foreign Direct Investment. World Economy , 30 (5), 764-82. Retrieved from: http://econ.sciences-po.fr/sites/default/files/file/tmayer/institutions_pub.pdf

Blonigen, B. A. (2005). A Review of the Empirical Literature on FDI Determinants.

Atlantic Economic Journal , 33 (4), 383-403. Retrieved from: http://pages.uoregon.edu/bruceb/FDISurvey2.pdf

Brainard S.L., (1997), An empirical assessment of the proximity concentration tradeoff between multinational sales and trade, American Economic Review 87 (4), 520-544.

Brainyard, S. L., (1993) "An empirical assessment of the proximity concentration tradeoff between multinational sales and trade", National Bureau of Economic Research. Retrieved from: http://www.nber.org/papers/w4580.pdf?new_window=1

Bahmaid , S. (2013). "Study on Foreign Direct Investment in Education" International Journal of Advanced Trends in Computer Science and Engineering, 2 (1), 519 – 531 Retrieved from: http://warse.org/pdfs/2013/icacsesp94.pdf

Buthe, T. & Milner, H. (2008). "The Politics of Foreign Direct Investment into Developing Countries: Increasing FDI through International Trade Agreements?" American Journal of Political Science, 52 (4), 741–762 Retrieved from: http://isites.harvard.edu/fs/docs/icb.topic741392.files/ForeignInvestment.pdf

Busse, M., Königer, J. and Nunnenkamp, P. (2008). "FDI Promotion through Bilateral Investment Treaties: More Than a Bit?", Kiel Institute (1403). Retrieved from: http://ideas.repec.org/p/kie/kieliw/1403.html

Busse, M. and Hefeker, C. (2005). "Political Risk, Institutions and Foreign Direct Investment", Hamburgisches Welt-Wirtschafts-Archiv (315). Retrieved from:http://www.econstor.eu/bitstream/10419/19287/1/315.pdf

BISSOON, O. (2011). "Can better institution attract more foreign direct investment (FDI) Evidence from developing countries" International Conference on Applied Economics, 59-70. Retrieved from: http://kastoria.teikoz.gr/icoae2/wordpress/wp-content/uploads/2011/10/007.pdf

Central bank of Turkey (2013), Foreign direct investment. Retrived from: http://www.tcmb.gov.tr/

Carr, D. L., Markusen, J. R., & Mask, K. E. (2001). Estimating the Knowledge-Capital Model of the Multinational Enterprise. The American Economic Review , 91(3), 693-708. Retrieved from: http://ces.univ-paris1.fr/membre/toubal/M1/CI/10_CMM.pdf

Christian Bellak (2013). "How Bilateral Investment Treaties Impact on Foreign Direct Investment: A Meta-analysis of Public Policy", MAER Network Colloquium, University of Greenwich. Retrieved from: http://www2.gre.ac.uk/__data/assets/pdf_file/0006/822705/Christian-Bellak-How-Bilateral-Investment-Treaties-Impact-on-Foreign-Direct-Investment-A-Meta-analysis-of-Public-Policy.pdf

Coskun, R. (2001). "Determinants of foreign direct investment in Turkey" European Business Review 13(4), 221-226. Retrieved from: http://web.sakarya.edu.tr/~coskun/DOKUMANLAR/determinants%20of%20foreign%20direct%20investment%20in%20Turkey-reccos.pdf

Clark, K., (2009) "Factor Proportion Hypothesis" Manchester University. Retrieved from:

http://personalpages.manchester.ac.uk/staff/ken.clark/wikis/content/Heckscher-Ohlin,%20'Factor%20proportion%20Hypothesis'..html

Donaubauer, J. , Herzer, D. & Nunnenkamp, P. (2013). "Does Aid for Education Attract Foreign Investors? An Empirical Analysis for Latin America". Retrieved from: http://www.fiw.ac.at/fileadmin/Documents/Publikationen/Working_Paper/N_120-DonaubauerHerzerNunnenkamp.pdf

Demirhan, E. and Masca, M. (2008) Determinant's of foreign direct investment flows to developing countries: a cross sectional analysis" Prague Economic Papers 4, 356-369. Retrieved from: http://www.vse.cz/polek/download.php?jnl=pep&pdf=337.pdf.

Dunning, J. H. (2001). "The Eclectic (OLI) Paradigm of International Production: Past, Present and Future" Economics of Business, 8(2), 173-190. Retrieved from: http://faculty.ksu.edu.sa/ahendy/313%20ECON/Syllabus%20and%20Handouts/Dunning1.pdf

Dunning, J. H. (1993). Multinational Enterprises and the Global Economy. New

York: Addison-Wesley.

Delbecque,V., Méjean, I., and Patureau, L. (2007). "What impact of Labor Market Institutions on FDI decisions? An investigation using French-firm data", EUROFRAME.. Retrieved from: http://www.euroframe.org/fileadmin/user_upload/euroframe/docs/2007/session3/EUROF07_Patureau.pdf

Esiyok, B. (2010, June). *Determinants of foreign direct investment in Turkey: a panel study approach.* Retrieved June 2013, from EconPapers: http://econpapers.repec.org/paper/pramprapa/36568.htm

Eicher, T. and Kang, J. (2003). "Trade, Foreign Direct Investment or Acquisition: Optimal Entry Modes for Multinationals", University of Washington. Retrieved from: http://faculty.washington.edu/te/papers/eicherkang.pdf

Fagan, D. (2009). "The U.S. Regulatory and Institutional Framework for FDI", A Reference Series for Chinese Investors , 2. Retrieved from: http://www.vcc.columbia.edu/pubs/documents/FaganFinalEnglish_001.pdf

Gaulier, G., Mirza, D., Turban, S., and Zignago, S. (2008), "International Transportation Costs Around the World: a New CIF/FoB rates Dataset", CEPII Research and Expertise on the World Economy. Retrieved from: http://www.cepii.fr/baci_data/freight_rates/freight_rates_doc.pdf

Helpman, E. *(1987), Imperfect Competition and International Trade: Evidence from Fourteen Industrial Countries. Journal of the Japanese and International Economics, 1 (1), 62-81*

Hara, M. & Razafimahefa, I. , (2003). "The determinants of Foreign Direct investment into Japan" Kobe University. Retrieved from: http://www.econ.kobe-u.ac.jp/doc/seminar/DP/files/126.pdf

Haksoon, K. (2010). "Political Stability and Foreign Direct Investment" International Journal of Economics and Finance, 2(3), 59-71. Retrieved from: http://www.ccsenet.org/journal/index.php/ijef/article/download/6822/5344

Hallward-Driemeier, M. (2003). "Do Bilateral Investment Treaties Attract FDI?" World Bank. Retrieved from: http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-3121

Saime S. Kayam, M. H. (2009, March). *Determinants of Turkish FDI Abroad.* Retrieved June 2013, from Loyola University Chicago: http://www.luc.edu/orgs/meea/volume11/PDFS/Paper-by-Kayam&Hisarciklilar.pdf

Sakali, C. (2013) "Determinants of foreign direct investment in Bulgaria" EAST-WEST Journal of ECONOMICS AND BUSINESS, 16(1), 73-97. Retrieved from: http://www.u-picardie.fr/eastwest/fichiers/art168.pdf

Stoiana, C. and Filippaiosa, F. (2008) "Dunning's eclectic paradigm: A holistic, yet context specific framework for analysing the determinants of outward FDI: Evidence from international Greek investments" International Business Review, 17(3), 349–367, Retrieved from: http://www.sciencedirect.com/science/article/pii/S0969593108000024

Tintin, C. (2012). "The effect of foreign direct investment on labor income: evidence from OECD countries", International Journal of Economic Studies, 4(1). Retrieved from: http://www.sobiad.org/eJOURNALS/journal_IJEF/archieves/2012_1/cem_tintin.pdf

Jude, C. and Levieuge, G. (2013). "Growth effect of FDI in developing economies: The role of institutional quality", Université d'Orléans. Retrieved from: http://www.univ-orleans.fr/leo/infer/POP_SILAGHI_Jude_Levieuge.pdf

Kinda, T. (2008). "Investment Climate and FDI in Developing Countries: Firm-Level Evidence", Université d'Auvergne. Retrieved from: http://www.researchgate.net/publication/222693858_Investment_Climate_and_FDI_in_Developing_Countries_Firm-Level_Evidence/file/72e7e522868927b4dd.pdf

Karl P. Sauvant and Lisa E. Sachs (2009). "The Effect of Treaties on Foreign direct investment: bilateral investment treaties, double taxation treaties, and investment flows" Oxford University Press

Markusen, J. *(1998), Multinational Firms, Location and Trade. The World Econom. 21(6), 733-56*

Markusen,J., Venables, A. (1997). "Multinational firms and the new trade theory" Journal of International Economics, 46 (1998), 183–203. Retrieved from: http://www.princeton.edu/~erossi/courses_files/Markusen.pdf

Ministry of Economy. (2012, April). *Foreign Direct Investment in Turkey*. Retrieved June 2013, from Republic of Turkey: Ministry of Economy: http://www.economy.gov.tr/upload/C161EFB8-A8F3-6038-3B618342F8BA89B1/FDI_2011.PDF

Moosa, I. (2005) "The determinants of foreign direct investment in MENA countries: an extreme bounds analyses" Economic Research forum. Retrieved from: http://www.erf.org.eg/CMS/uploads/pdf/1183874104_RR0421.pdf

Mina, W. (2010) "Do Bilateral Investment Treaties Encourage FDI in the GCC Countries?" African Review of Economics and Finance, 2(1). Retrieved from: http://www.african-review.com/Vol.%202%20(1)/Bilateral%20Investment%20Treaties%20and%20FDI.pdf

Limao, N., & Venables, A. J. (2001). Infrastructure, Geographical Disadvantage and Transport Costs. World Bank Economic Review , 15 (3), 451-79. Retrieved from: http://siteresources.worldbank.org/EXTEXPCOMNET/Resources/2463593-1213975515123/09_Limao.pdf

Lahreche-Revil, A. (2006). Who is Afraid of Tax Competition? Harmless Tax Competition from the New European Member States. CEPII Research Center Working Paper Series, No.2006-11 . Retrieved from: http://www.cepii.fr/PDF_PUB/wp/2006/wp2006-11.pdf

Lars P. Feld and Jost Henrich Heckemeyer (2009)." FDI and Taxation: A Meta-Study" CESIFO (2540). Retrieved from: http://ideas.repec.org/p/ces/ceswps/_2540.html

Neumayer, E. a. (2005). *Do bilateral investment treaties increase foreign direct investment to developing countries?* Retrieved June 2013, from The London school of Economics and Political Science: http://eprints.lse.ac.uk/627/

Ozatay, F. and G. Sak (2002), 'The 2000-2001 financial crisis in Turkey', paper presented at the Brookings Trade Forum 2002: Currency Crises, Washington D.C. Retrieved from: http://www.bankofalbania.org/web/pub/turku_ang_230_1.pdf

Pournarakis, M. and Varsakelis, N. (2004). "Institutions, internationalization and FDI:the case of economies in transition" Transnational Corporations, 13(2). Retrieved from: http://unctad.org/en/docs/iteiit20045a5_en.pdf

Parcon, H. (2008). "Labor Market Flexibility as a Determinant of FDI Inflows" University of Hawai'i at Mānoa. Retrived from: http://www.economics.hawaii.edu/research/workingpapers/WP_08-7.pdf

Pflüger, M., Blien, U., Möller, J. and Moritz, M. (2010) "Labor Market Effects of Trade and FDI: Recent Advances and Research Gaps", IZA (5385), Institute for the Study of Labor. Retrieved from: http://ftp.iza.org/dp5385.pdf

Pandya, S. (2010). "Labor Markets and the Demand for Foreign Direct Investment" International Organization 64, 389–409. Retrieved from: http://faculty.virginia.edu/spandya/fdiprefs_iofinal.pdf

Rajan, R (2004). "Measures to Attract FDI: Investment Promotion, Incentives and Policy Intervention" Economic and Political Weekly, 12-16. Retrieved from: http://lkyspp.nus.edu.sg/ips/wp-content/uploads/sites/2/2013/04/pa_kishen_Measures-to-Attract-FDI.pdf

Ranjan, V. and Agrawal, G. (2011), "FDI Inflow Determinants in BRIC countries: A Panel Data Analysis", International Business Research 4, (4). Retrieved from: http://www.ccsenet.org/journal/index.php/ibr/article/download/12386/8681.

Waldkrich, A. (2003), "Vertical FDI? A host country prospective", Oregon State University. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=470162

Waldkirch, A. (2010). "The Structure of Multinational Activity: Evidence from Germany". Applied Economics, 42 (24), 3119-33. Retrieved from: http://www.tandfonline.com/doi/abs/10.1080/00036840801964872#.Ur7oqvRDuiU

World Bank (2012), Country Data Report for Turkey, Retrieved from: http://info.worldbank.org/governance/wgi/pdf/c221.pdf

References

Baltagi, B.H., (2002):"Econometrics" 3rd Edition, pp. 307-319

Cerrato, M. (2001). "The Cross Sectional Dependence Puzzle" London Guildhall University. Retrieved from: http://repec.org/res2002/Cerrato.pdf

Ernst & Young (2013). "Ernst & Young's attractiveness survey: Turkey" Retrieved from: http://www.ey.com/Publication/vwLUAssets/Turkey_attractiveness_survey_2013/$FILE/turkey_attractiveness_2013.pdf

Hara, M. & Razafimahefa, I. , (2003). "The determinants of Foreign Direct investment into Japan" Kobe University. Retrieved from: http://www.econ.kobe-u.ac.jp/doc/seminar/DP/files/126.pdf

Index Mundi (2011), Turkey - Education expenditure. Retrieved July 2013, from Index Mundi: http://www.indexmundi.com/facts/turkey/education-expenditure

Macovei, M. (2009). "Growth and economic crises in Turkey: leaving behind a turbulent past?" European Economy, (386). Retrieved from: http://ec.europa.eu/economy_finance/publications/publication16004_en.pdf

Pesaran, H. (2013). "Large Panel Data Models with Cross-Sectional Dependence: A Surevey", University of Cambridge. Retrieved from: http://www.econ.cam.ac.uk/CSDPDM/course-files/Pesaran_LargePanels_Cambridge_26May2013.pdf

UNCTAD. (2012). *Investment Country Profiles: Turkey*. Retrieved June 2013, from UNCTAD: http://unctad.org/en/PublicationsLibrary/webdiaeia2012d6_en.pdf

Data sources:

1. **GDP ,** extracted from unstats.un.org
2. The share of GDP (%) dedicated for Ministry of National Education.

   URL: http://sgb.meb.gov.tr/istatistik/meb_istatistikleri_orgun_egitim_2012_2013.pdf

3. **Political Stability index**

   URL: http://info.worldbank.org/governance/wgi/index.aspx#reports

4. **Inward FDI by countries** extracted from comtrade.un.org
5. **Import and Export data,** extracted from UN Comtrade databse (comtrade.un.org)
6. **Rule of Law and Political Stability** extracted from www.govindicators.org.

Annex

Pooled OLS model

```
Oneway (individual) effect Pooling Model

Call:
plm(formula = LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law,
    data = fdi.set, model = "pooling", index = c("Country", "Year"))

Balanced Panel: n=29, T=12, N=348

Residuals :
   Min. 1st Qu.  Median 3rd Qu.    Max.
-5.0500 -1.5500  0.0692  1.5800  5.9100

Coefficients :
            Estimate Std. Error t-value     Pr(>|t|)
(Intercept)  -2.8882     1.0381   -2.78       0.0057 **
LnSimIndex    0.0135     0.1946    0.07       0.9445
TC           -0.0785     0.0260   -3.02       0.0027 **
PolStab       2.8602     1.0756    2.66       0.0082 **
Educ          3.9773     0.5960    6.67 0.0000000001 ***
Law          -5.1347     2.2621   -2.27       0.0238 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Total Sum of Squares:    2100
Residual Sum of Squares: 1760
R-Squared      :  0.161
      Adj. R-Squared :  0.158
F-statistic: 13.1017 on 5 and 342 DF, p-value: 0.0000000000111
```

Random Effects model

```
Oneway (individual) effect Random Effect Model
   (Swamy-Arora's transformation)

Call:
plm(formula = LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law,
    data = fdi.set, model = "random", index = c("Country", "Year"))

Balanced Panel: n=29, T=12, N=348

Effects:
                var std.dev share
idiosyncratic 3.13    1.77  0.59
individual    2.19    1.48  0.41
theta:  0.674

Residuals :
   Min. 1st Qu.  Median 3rd Qu.    Max.
 -5.510  -1.070   0.105   1.130   5.460

Coefficients :
            Estimate Std. Error t-value             Pr(>|t|)
(Intercept)  -2.5456     1.0324   -2.47               0.0142 *
LnSimIndex    0.1450     0.4307    0.34               0.7366
TC           -0.1145     0.0351   -3.26               0.0012 **
PolStab       2.8696     0.8389    3.42               0.0007 ***
Educ          3.9395     0.4668    8.44 0.00000000000000091 ***
Law          -4.9300     1.7713   -2.78               0.0057 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Total Sum of Squares:    1390
Residual Sum of Squares: 1070
R-Squared      :  0.232
      Adj. R-Squared :  0.228
F-statistic: 20.682 on 5 and 342 DF, p-value: <0.0000000000000002
```

Fixed Effects model

```
Oneway (individual) effect Within Model

Call:
plm(formula = LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law,
    data = fdi.set, model = "within", index = c("Country", "Year"))

Balanced Panel: n=29, T=12, N=348

Residuals :
   Min. 1st Qu.  Median 3rd Qu.    Max.
-5.6800 -0.9650  0.0428  1.0300  5.3500

Coefficients :
           Estimate Std. Error t-value          Pr(>|t|)
LnSimIndex   0.9154     1.0781    0.85           0.39646
TC          -0.1334     0.0403   -3.31           0.00105 **
PolStab      2.8573     0.8401    3.40           0.00076 ***
Educ         3.8549     0.4767    8.09 0.000000000000013 ***
Law         -4.7912     1.7774   -2.70           0.00740 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Total Sum of Squares:    1310
Residual Sum of Squares: 984
R-Squared      :  0.248
      Adj. R-Squared :  0.224
F-statistic: 20.7653 on 5 and 314 DF, p-value: <0.0000000000000002
```

Testing for panel effects

```
> # Testing for fixed effects, null: OLS better than fixed
> pFtest(fem, pooled)

        F test for individual effects

data:  LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law
F = 8.8, df1 = 28, df2 = 314, p-value < 0.00000000000000022
alternative hypothesis: significant effects


        Lagrange Multiplier Test - (Breusch-Pagan)

data:  LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law
chisq = 284, df = 1, p-value < 0.00000000000000022
alternative hypothesis: significant effects
```

Hausman Test

```
data:  LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law
chisq = 1.3, df = 5, p-value = 0.9325
alternative hypothesis: one model is inconsistent
```

Test for White standard errors clustered by group

```
t test of coefficients:

           Estimate Std. Error t value         Pr(>|t|)
LnSimIndex   0.9154     1.3491    0.68          0.49795
TC          -0.1334     0.0214   -6.23 0.00000000149364 ***
PolStab      2.8573     0.8757    3.26          0.00122 **
Educ         3.8549     0.5159    7.47 0.00000000000079 ***
Law         -4.7912     1.4134   -3.39          0.00079 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Cross-sectional dependence/contemporaneous correlation

Testing for cross sectional depndence: using Breusch-Pagan LM test of independence and Pasaran CD test

```
Breusch-Pagan LM test for cross-sectional dependence in panels

data:  formula
chisq = 645, df = 406, p-value = 0.0000000000004168
alternative hypothesis: cross-sectional dependence


        Pesaran CD test for cross-sectional dependence in panels

data:  formula
z = 16, p-value < 0.00000000000000022
alternative hypothesis: cross-sectional dependence
```

Testing for serial correlation and heteroskadesticity

```
        Breusch-Godfrey/Wooldridge test for serial correlation in panel
models

data:  LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law
chisq = 95, df = 12, p-value = 0.000000000000004917
alternative hypothesis: serial correlation in idiosyncratic errors


        Breusch-Pagan test

data:  LnFDI ~ LnSimIndex + TC + PolStab + Educ + Law
BP = 9.8, df = 5, p-value = 0.07974
```

Controlling for Heteroskedasticity and serial correlation

```
t test of coefficients:

           Estimate Std. Error t value         Pr(>|t|)
LnSimIndex   0.9154     1.3491    0.68          0.49795
TC          -0.1334     0.0214   -6.23 0.00000000149364 ***
PolStab      2.8573     0.8757    3.26          0.00122 **
Educ         3.8549     0.5159    7.47 0.00000000000079 ***
Law         -4.7912     1.4134   -3.39          0.00079 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```